DOCUMENT RESUME

ED 044 917 EM 008 572

AUTHOR	Meaney, John W., Ed.; Carpenter, C. Ray, Ed.
TITLE	Telecommunications: Toward National Policies for Education. The Report of the National Conference on Telecommunications Policy in Education, The Georgia Center for Continuing Education, Athens, Georgia, December 4-6, 1968.
INSTITUTION	Joint Council on Educational Telecommunication, Washington, D.C.
SPONS AGENCY	Charles F. Kettering Foundation, Dayton, Ohio.; Ford Foundation, New York, N.Y.
PUB DATE	70
NOTE	201p.
EDRS PRICE	EDRS Price MF-$1.00 HC-$10.15
DESCRIPTORS	Adult Education, Broadcast Television, Cable Television, Communication Satellites, *Education, Information Systems, Interinstitutional Cooperation, Professional Continuing Education, *Public Policy, Social Change, Social Problems, Systems Approach, *Telecommunication, Urban Education, Urban Environment
IDENTIFIERS	Corporation for Public Broadcasting, JCET, Joint Council on Educational Telecommunications, Presidents Task Force on Communications Policy

ABSTRACT

Papers from a conference on telecommunications are presented in this report, as well as the discussion and recommendations of the five conference commissions. The papers are concerned with education and telecommunications, the Corporation of Public Broadcasting, information systems for the future, cable television, satellite systems, the President's Task Force on Communications Policy, and systems applications. The work and reports of the conference commissions centered around the relationships of telecommunication with universities, schools, preschool education, continuing education, and urban education. The recommendations of the conference commissions were that: the Joint Council on Educational Telecommunications (JCET) should insure the recognition of education's stake in the new technologies, that JCET should emphasize the importance of the opportunity that now exists to bring two-way cable communications into the American home, that JCET should help with strategy to use communications media in attacking social problems, that JCET should join with other agencies to bring about cooperative production of instructional materials, and that JCET should urge the United States Office of Education to expand its programs for training faculty and technicians in the use of telecommunications. (MF)

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TELECOMMUNICATIONS:
Toward National Policies For Education

EM 008 572

Joint Council on Educational Telecommunications
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ED044917

TELECOMMUNICATIONS:

TOWARD NATIONAL POLICIES FOR EDUCATION

John W. Meaney

and

C. Ray Carpenter

Editors

The report of the National Conference on Telecommunications Policy in Education, The Georgia Center for Continuing Education, Athens, Georgia, December 4–6, 1968.

FOREWORD

The original Joint Council on Educational Television (JCET) sponsored the first national conference on the formulation of national policies for educational television. This conference was held at The Pennsylvania State University in 1952 and the report was edited by Carroll V. Newsom. A second conference held at Penn State in 1957, and again with JCET and American Council on Education sponsorship, focused attention on what had been learned about the place of television in instruction and on the special implications for American higher education. The report on college teaching by television was edited by John C. Adams, Dorothy Smith, and myself.

After the reorganization of JCET into the present Joint Council on Educational **Telecommunications,** it seemed entirely appropriate for the council with funds from the Charles F. Kettering and Ford Foundations to sponsor another national conference, this time at the Georgia Center for Continuing Education, the University of Georgia, Athens.

The first national conference laid the basis for policies on station-channel reservations for education and their development, whereas the third conference is responding to a greatly expanded set of problems consequent upon the rapid development of communication technologies. Among other developments are included color, bi-directional communications, videotape recording and reproduction, multichannel distribution by cable, "narrow-casting," point-to-points microwave distribution, the application of laser beams in communications, and finally satellite relay systems for continental and intercontinental distribution of cultural, educational, and instructional programs.

The intended emphasis of the third conference in Georgia was on education problems, social needs, and how to respond to these by means of telecommunication instrumentation. These emphases are reflected in the stated purposes of the Georgia conference:

1. To assess our nation's future education and community services for telecommunications.
2. To explore telecommunications alternatives . . . which might be used to meet community needs and to ascertain the unique role of each element in a total systems approach to the solution of critical community problems.

3. To examine the role of educational communications in American life to see what might be done to mobilize its many components, singly and in combinations, in a massive attack on some of the major problems of our communities.

The orientation of plans for the conference in Georgia toward societal needs and requirements is reflected in the titles of the five conference commissions, their work, and their recommendations for policy guidance and for action: I. The University and Interinstitutional Cooperation, II. The School and Preschool Education, III. Continuing, Professional, and Adult Education, IV. Urban Education and Urban Problems, and V. Rural America.

The characteristics of the conference and the span and depth with which it dealt with its tasks were basically determined by the experiences and abilities of the people who attended the conference. However, the complexity of the subjects, the diversity of viewpoints, and the vast amount of available evidence required more than the limited two and one-half days of intensive work to accomplish the desired results. One of the commissions has held subsequent meetings, and several of them recommended sustained or continuing action.

The number and depth of the summary statements and recommendations accurately reflect what the conference achieved. This conference like many other similar short-term efforts found it most difficult to conceptualize and express broad fundamental policies with long-term perspective which could provide national guidance in the complex areas of social requirements, education, and telecommunications. Actually, the 1968 National Conference on Telecommunications Policy and Education yielded much evidence and many opinions contingent to the formulation of national policy. It was propaedeutic to policy formulations which would guide the efforts and developments of education in its uses of telecommunication technologies as means of attacking the problems and issues which perennially challenge the nation's educational efforts.

Since the Georgia conference two important commissions have made their reports, both of which are summarized in the appendix of this conference report. Almost simultaneously with the Georgia conference, the President's Task Force on Communications Policy was issued in December 1968. Of close relevance to the Georgia conference is the work of the Commission on Instructional Technology which was

authorized by Title III of the Public Broadcasting Act of 1967. The report of this nine-man commission was completed in the summer of 1969 and channeled through the U.S. Office of Education and the Office of the Secretary of Health, Education, and Welfare to the Office of the President. In March 1970, the report was sent to Congress. Both reports are available for study in the drafting of new legislation.

The Georgia conference was conceived and nurtured by the Board of the Joint Council on Educational Telecommunications. In response, the conference has outlined many tasks important for JCET to undertake and accomplish. Among the suggested tasks perhaps the most important are to insure that education's interests and voices are forcefully represented in public telecommunications planning and in the drafting and enacting of future legislation. Thus, the JCET of 1968 and forward continues the earlier mission which was so successfully accomplished by the JCET of the late forties and early fifties.

C. Ray Carpenter

DIGEST AND SUMMARY OF THE RECOMMENDATIONS OF THE CONFERENCE COMMISSIONS

1. JCET should undertake prompt action to reaffirm and insure the recognition of education's stake in communications satellites as well as in all new technologies. Specifically included in this recommendation is the necessity for the protection of education's needs for spectrum space. To begin the implementation of this recommendation the JCET will file appropriate comments in Federal Communications Commission Dockets No. 18262 (Proposed reassignment of the upper UHF frequencies to land mobile radio services) and No. 18294 (Inquiry relating to the preparation for a world administrative radio conference of the International Telecommunications Union on matters pertaining to the radio astronomy and space services).

2. JCET should emphasize in every possible way the importance of the opportunity that now exists to develop and demonstrate in the near future a system of two-way cable communications into American homes in order to provide an interactive mode of telecommunications so that direct citizen participation may become a reality.

3. JCET should emphasize the need to develop a task force to design strategy specifically for the use of communications media in making a frontal attack on major social problems. This would be carried out in close liaison with other agencies concentrating on additional aspects and dimensions of those problems, and it would imply an immediate need to identify, evaluate, and exploit new telecommunications resources, especially in the adult education field.

4. JCET should join with private and government agencies and foundations to encourage the establishment of policies favoring the allocation of resources for the cooperative production of instructional materials.

5. JCET should urge USOE (through the Education Professions Development Act and other legislation) to initiate and enlarge existing programs for the development of faculty and technical training in the use of telecommunications.

6. JCET should point out anew the need to intensify efforts on all strategic fronts to safeguard the needs of education in the revision of the copyright law.

7. JCET should work with the FCC to obtain allocations in AM, FM, and TV that can serve remote and sparsely populated areas, to obtain adoption of rules favorable to the use of TV and satellite translators in applications unique to rural areas, and to develop rules permitting semicommercial cooperative radio and other telecommunications means of meeting priority needs of the rural population.

ACKNOWLEDGMENTS

The editors of this report acknowledge the central roles taken by Harold E. Wigren, president of the Joint Council on Educational Telecommunications and Frank W. Norwood, executive secretary, and commend them for their sustained and successful efforts in gaining support for the conference and in planning and conducting its complex exploratory program.

The JCET members and Board of Directors are pleased to express their gratitude to the University of Georgia and the Georgia Center for Continuing Education, specifically to Robert C. Anderson and Thomas W. Mahler for inviting the conference to the university and for serving so effectively as hosts.

The principal financial support was given by the Ford Foundation and the Charles F. Kettering Foundation. The International Business Machines Company and the Southern Bell Telephone Company made possible the Docu-Drama and a reception.

Gratitude is expressed to the people who attended the conference and gave their energies and days of their time to exploring basic facts, conditions, and contingencies to the formulation of needed national policies in the important areas of telecommunications and education. By their contributions they have made advances toward the achievement of plans through policy guidance for the rapidly emerging communication technologies which can be useful in helping to meet this country's educational responsibilities.

REMARKS OF WELCOME

Fred C. Davison, President

University of Georgia

"... I think that it is entirely proper that this policy conference should be held in Athens at the University of Georgia. At this time our university is going through dramatic changes, and certainly as its president I am watching this conference with a great deal of interest. Never before has education been faced with the challenges and opportunities we have today, and never before have we needed so much the proper use of advanced new technologies for meeting these challenges and for taking advantage of these opportunities...."

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THE CONFERENCE THEME AND TASK*

C. Ray Carpenter

Instead of this being an information giving conference, it is planned as an information collecting and deliberating conference. We should not expect complete consensus or conclusions in a group this large and varied, but we should harvest the fruits of diversity. Our great need is for conceptual contributions at the highest levels to the formulation of policy constructs for the development and use of advancing telecommunications technologies to meet the nation's human demands for education. Priority should be given to national policies and plans, but international perspectives should also be included.

The following are some of the major issues, problems, and questions that challenge our deliberations:

1. How can we use telecommunications to advance rapidly understanding of the great range of crucial problems related to human variabilities?

2. What policies are needed to cover the central-to-peripheral continuum and to answer the question: Where in the nation should rest what powers and accountable responsibilities in the areas of educational telecommunications?

3. What policies should govern the issues of social regulatory mechanisms: the rational, logical, and relatively objective ones as contrasted with irrational, illogical, and subjective behavior?

4. What policies foster the long-term broad spectrum of human values in contrast to the narrow perspectus of ego-ethno-centrism of our culture?

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*C. Ray Carpenter is emeritus research professor of psychology and anthropology at The Pennsylvania State University and research professor of psychology and anthropology at The University of Georgia. As Conference chairman, he made this statement at the First General Assembly.

5. This conference has three directions:

    1. A working session,
    2. A meeting place for small group deliberation, and
    3. An opportunity for individual statements of diverse points of view since there is little prospect of a concensus of the whole conference.

6. What recommendations does this conference propose to each of the following groups:

    The Corporation for Public Broadcasting,

    The Commission on Instructional Technology,

    The Federal Communications Commission,

    Federal and state government departments?

7. What formal responses should this conference make to the preliminary Report of the President's Task Force on Communications Policy?

8. What policy statements are needed to reinforce and activate the research-development-action continuum? Can there be balanced profiles of emphasis and appropriately distributed investments of efforts and resources?

    - The relevance issues
    - The pure and applied science issues
    - The question of whether or not there is a need to reestablish the prestige of research in the communication fields.

9. What policy statements would promote modernizing and building ethical and equitable systems of rewards and penalties in the fields of educational telecommunications?

10. What policies would encourage **appropriate** explorations of the valid, extended, and intensive uses of computer **regulated** learning?

11. What policies are needed to produce eventually the large number of validated instructional programs for use with computers and related technologies?

12. What policies are needed for encouraging the uses of appropriate technologies, at specified levels of scholastic and personal development, and for making effective provisions for individual differences in learning abilities and predispositions?

13. What policies are needed for modernizing educational and instructional telecommunications equipment or for solving the problems of the antiquation of educational methods?

14. What policies will encourage cooperative development and scheduling of educational and instructional materials over broad geographic areas in order to take advantage of rapidly increasing broad channels and satellite relay distribution for meeting educational demands?

15. What new policies are needed for regulating satellite relay distribution of instructional-educational programs:

on a regional basis,

on a national basis, and

on an international basis?

16 What general policy formulations are needed to advance the appropriate uses of educational telecommunications in disseminating to users the rapidly increasing amounts and kinds of scientific and engineering information?

17. What new general policies could govern revisions of the copyright law for educational units, programs, and curriculums mediated by telecommunication systems?

18. How can there be put into effect an equitable sharing of the rewards and profits from the cooperative developments of educational-instructional programs produced by several agencies and with the help of many people?

19. How can there be developed for people in educational telecommunications an esprit de corps which reinforces and fosters the concept of responsible academic freedom in knowledge and instruction distribution by means of telecommunications?

20. How can policies be so framed and implemented as to be constructive and not unduly constrictive on educational activities?

21. How can a better than present balance be established and maintained in the nation among the several sets of educational telecommunications functions?

22. How can the functions of programing and use be advanced, for example, to match better than now the distribution functions?

23. Furthermore, what policies are needed to increase the benefits and effectiveness of industrial-educational exchanges and cooperation in the area of educational telecommunications?

24. What quality standards--or quality control procedures--need to be developed in the educational telecommunication enterprises, and how are these standards to be applied?

25. What policies are needed for increasing the accessibility and practical uses of information "knowledge banks" and instructional data pools?

26. How can we develop and use "sensors," "scanners," and "detectors" of critical social problems, estimate their degrees of criticality, and bring the forces of telecommunications to bear promptly on the most critical problems?

EDUCATION AND TELECOMMUNICATIONS*

Charles Frankel

When I first received the invitation to speak to a conference on telecommunications and education, the thought occurred to me that the world was certainly full of unknowing people--unknowing about telecommunications, and unknowing about me. Only a poverty of resources so unrelieved as to offer no hope for the educational use of telecommunications could explain so desperate a choice of a keynote speaker.

But more serene second thoughts intervened. As a professor of philosophy, I possess, I reminded myself, a universal credit card, honored almost everywhere, which gives me a license to play the know-it-all. And to this I can add the credentials of an ex-government official. Service in government gives a man ample experience in talking on issues he understands only superficially.

Besides, as I know from long exposure to discussions of education, ignorance is not a barrier to participation. In fact, those who know that they are ignorant may have something rare and of unusual merit to contribute. For education, in the end, is a philosophical venture. It has to do with the goals of life and society, and with standards of collective discipline and personal achievement. We cannot demonstrate the validity of such goals and standards scientifically. Indeed, even after centuries of talk about education, we cannot really say that we know how to set about achieving the larger, more long-range educational goals that we may chart for ourselves. We know something, perhaps, about how to avoid mistakes; we probably know something, too, about how to achieve narrow, short-range objectives, like teaching stenography, spelling, or foreign languages. But the moment we extend our perspective and talk about the broader qualities of mind and character which we would hope that schooling might help to impart to its recipients, we have to confess, I think, that we know lamentably little. And yet we cannot approach the discussion of

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*Charles Frankel, professor of philosophy, Columbia University, delivered this Keynote Address at the First General Assembly.

education without keeping these larger considerations in mind. Or rather, we can ignore them, but at the price of confessing that we do not care about them. For whether or not we pay explicit attention to them, our conduct and our decisions presuppose such goals and standards and commit us further to them.

From time to time, in private life and in government service, I have had to rub my nose in a few of the hard facts of telecommunication as an instrument of education. I believe that I learned from this experience that technical knowledge of telecommunications, though important, can also be a source of blindness and self-deception. For larger, nontechnical issues--moral and social issues of concern to everyone who is a teacher or citizen--are also involved. The relation of telecommunications to education is one of the questions on which the shape of our society and the character of the teaching enterprise in the future are going to depend. And experts and pure technicians should not be permitted--and will not be permitted--an exclusive role in answering such questions. Laymen must and will play a part. It is desirable, therefore, that an exchange of reasoned views between the technicians and the laymen, the telecommunicators and the teachers, begin at once. It is with the need for such an interchange in mind that I have composed my remarks.

It is best to begin, I think, by recognizing that reactions to the use of telecommunications in education are not, in the first instance, cold-blooded, rational reactions. Whether they are favorable or unfavorable, they breathe a Weltanschauung; they express the reactions of people who--quite apart from education--are thrilled by new machinery or are chilled by it. Education is an old business, and technological innovation, in our society, is also a long-standing affair. And the question of what to do with telecommunications has emerged in a society in which profound tensions already exist about the responsibility of education to adapt to a technological society, and about the responsibility of our society to tame and control what seems to many people to be a runaway technology. Indeed, technology has changed our politics, morals and social structure, our work and enjoyments, and our personal relations beyond the recognition of people of even fifty years ago and bids fair to have an even greater effect in the future. The role of telecommunications in our educational system has to be approached in this larger context. Otherwise, we shall not understand, I suggest, either the excitement or the resistance which the new educational technology arouses.

For there are, broadly speaking, two standard, stereotyped reactions to the emergence of telecommunications as potential instruments of education. The first is irritation, resentment, fear. The second is a sense that we are about to acquire a capacity to do all sorts of things that could never have been done before. There is even the sense that we may be on the verge of one of those fundamental transformations in the nature of man and society about which the religious used to speak, but of which the devotees of science and technology have now become the prophets. Neither of these standard, stereotyped reactions is a justified one, but each tells us something about the nature of the problem with which we have to deal. Both are reflections of the intense moral and social tension which technology has long produced in our civilization. For the emergence of telecommunications in their full power and glory as instruments which we contemplate using in education brings to a climax a major theme in modern Western civilization.

This is the development of what I would call "the technological style," the technological **formation mentale.** Technology is not simply machinery; it is a stance toward the world, a way of approaching things and events, and of organizing the relation of human beings to one another. What is distinctive of technology as a style is its explicitness, its analytic character, and its impersonality. A technology can be written down. It can be broken down into its several parts in verbal description. It can be taught, often without the assistance of living teachers, and, generally speaking, by teachers who have no personal relation to the people taught.

Moreover, technology as a mental style, as an attitude toward the environment, carries with it a distinct ethical outlook. A new technology does new things, or it does old things more powerfully, quickly, or efficiently. Its legitimacy, its rationale, is always specific, observable, definable. We know––or think we know––why we want it fairly exactly. What we usually do not know nearly so well is what its side effects are, or what its consequences will be in areas not charted on the precise technological map of achievement or failure. Still further, the identifiable benefit––the measurable gain in power or efficiency which a new technology brings––is generally taken to be a persuasive case for adopting it. The other consequences which it may bring are speculative and vague and cannot be weighed in the balance. They do not have the same rational standing––which is to say, for practical purposes, that they have less importance in our moral and social table of priorities. Thus, we build bridges into cities but do not measure the physiological and emotional costs of the traffic jams they generate; we multiply telephones but ignore their cost in

human tranquility and freedom to concentrate; we invent television but do not ask what the effect on higher education will be of young people who come to college having spent 25,000 to 50,000 hours of their lives in front of the little screen.

I do not mean to suggest that technology as a mental attitude is an unmixed danger. On the contrary, it has made an immense contribution to the moral and intellectual progress of mankind--if I may use such a grandiloquent phrase in a technological age. The technological style simplifies and tidies our thinking processes and, by introducing impersonal standards, brings to collective decision making the coloration of objectivity and impartiality. It makes mobility more possible--physical mobility, social mobility, intellectual mobility. It takes the sheen off subjective preferences, family loyalties, class prejudices. It breaks the crust of established institutions, exposes them in their inefficiency and superstition, and implicitly asks how they can be remade to serve practical human purposes better. And it imposes on people in different social stations and cultural climates something like a common set of values, habits, and ideas. In sum, technology is a form of culture, an instrument of education and of moral education. And it is such whether or not it is used deliberately in schools.

But if this is one side of technology, there is also another side to it, and to culture and education in general. Technology makes matters explicit; but in any pattern of human association and communication, there are matters about which people are not explicit. Technology demystifies; but there are areas of life that stubbornly preserve secrecy, mystery, astonishment, and preserve them even though we know a good deal about them. There is no culture, so far as I know, which, for example, does not transmute the well-known facts of sexual attraction, birth, maturation, and death into something more than they seem on the surface. All cultures give them an additional surface, surrounding them with rituals and ceremonies, and making it plain that words, in their explicit, descriptive use, are not adequate for organizing and expressing the human response to them. Even our contemporary culture, where explicitness has gone so far, illustrates this point, I think. The more we try to unveil the facts of man's animal conditions and treat them clinically and scientifically, the more we try to place them on a level with other homely facts of life, the plainer it is that we are looking not simply for explanations but for celebrations of them, or perhaps for liberation from them. The tell-it-like-it-is, no-hypocrisy approach to sex, birth, and death, I am inclined to suspect, is simply our technological culture's own peculiar way of finding catharsis.

But I do not want to make a case that there are areas of human life to which analysis and description are inappropriate, or which require us to retreat from reason. I have not chosen the occasion of an address on telecommunications to issue a recantation for my past sins as a rationalist in philosophy. What I wish to say is not that there are areas of human life that can be treated technologically and other areas which remain forever closed and secret. It is that, in every area of human experience and communication, the explicit is surrounded by what is merely implicit. Human learning, human knowledge, and communication go on in contexts in which gestures, actions, feelings, expectations, understandings, not themselves put into words, nevertheless fill out the meaning of words. Around every pinpoint of light, clarity, precision, in our experience as human beings, there is a larger penumbra of suggestion and indefiniteness. Words communicate, it might be said, because in almost all our ordinary doings they say more than they say. They are interpreted in the light of what we do not put into words, and which it would be exhausting to try to render explicit.

The technological style, therefore, has its inherent limits. And I suppose it is because representatives of this style often seem not to recognize these limits that they appear to their severer critics to be victims of hubris. To those who are frightened by the technological style, technology seems to wish to invade human relations and rob them of their deeper background of feeling and ambiguity. So they resist with special force the intrusion of telecommunications into education. They fear the intrusion of impersonality, calculation, and manipulation into the ultimate area of the formation of human mind and character. Education, they insist, is the transmission not only of what can be programed but of what is unprogramed. And unless those who speak for telecommunications are prepared to understand these fears and prepared to develop educational programs which take these fears into account insofar as they are realistic, they will make grandiose plans that are likely to come tumbling down around their heads.

All this, no doubt, seems a far distance from the practical questions about telecommunications which you have come together to discuss. Yet it offers us, I venture to suggest, a point of view toward such questions. At the very least, it permits us to avoid some of the grosser fallacies that affect the discussion of telecommunications in education.

One is the fallacy of supposing that telecommunications are value-free, neutral devices that can be used for any purposes we wish. Technology, as I have suggested, is a style of thought and conduct. And this

is to say that, like any other form of culture, it implies what is usually not rendered explicit. As we have begun--but only just barely--to discover in our foreign assistance programs and our work in ghettos and slums, a technique may be transportable and describable, but not the ethic that underlies it. Peasants can be taught how to use fertilizers to double the yield from their fields. They cannot be taught, in a simple A,B,C process, that the response to a doubled yield is not to work half the time, which is how some peasants have responded. A good deal can be taught by the technological style. What cannot be taught so easily is why anybody should follow that style. Even within a technological culture, teaching by explication does not, and cannot, wholly replace teaching by implication. Telecommunications cannot replace the need in every school for personal attention, immediate responsiveness, or models of behavior and achievement for students to emulate. And they are not sufficient by themselves to make up for handicaps in the environment which produce students with low motivation and limited capacity to learn. Beyond certain limits, which are probably fairly narrow, computers, television, films, and programed instruction cannot do what the immediate personal environment of the young fails to do.

Perhaps few advocates of the ambitious use of telecommunications in education make such extravagant claims. Nevertheless, it would be desirable for them to make the fact plain that they do not envisage telecommunications as instruments for redeeming us from all our educational failings. On the whole, telecommunications have shown themselves to be peculiarly effective instruments of education in highly structured situations where the motivations of individuals can already be counted on, where the educational objective is narrow, precise, and well defined, and where other measures are available to produce the broader set of moral and social attitudes which are desired. An army, with its discipline and its precise lists of the kinds of skilled people it needs, can rely heavily on telecommunications as instruments of education. But if they are to be widely used in other settings, the lessons learned from their military use probably have only a limited validity.

Yet what I have said does not at all imply that telecommunications should not be employed as ordinary, daily instruments of general education. This is a second fallacy. Precisely because telecommunications are part of a broader technological culture, they belong in our schools and colleges, in our libraries and in our efforts for adult education. The reason, in the last analysis, is not their technical efficiency but their intellectual and emotional significance. One of the most important long-range purposes

of education in our time is to train men and women capable of coping with and controlling science and technology. Neither unthinking resistance to technology nor unthinking idolatry of it will do the job. The reason for bringing telecommunications into the schools is precisely that they are technologies and can bring into the atmosphere and environment of the modern school a style, a way of doing things, with which modern men and women need to be acquainted. Today's students need to know these technologies--both their uses and their limits--by direct acquaintance, by direct use, and not only by hearing about them or enjoying what they produce.

Against this background, let me turn to some of the long-range purposes which education in our society is likely to have to meet, and the place that educational telecommunications can occupy in helping to fulfill these purposes. I would list these purposes under the following headings: (1) the maintenance and lifting of standards; (2) the easing of the communications glut; and (3) the expansion of the social functions of the educational system.

To speak of the "maintenance" of standards is to employ a weak phrase to describe what is now needed in our educational system. The remaking and retransmission of old standards and the development of new ones are closer to the mark. Television, films, and programed instruction cannot, I have suggested, replace teachers. It would be tragic, to my mind, to suggest that they are instruments for educating great masses of people for whom there is an insufficient supply of teachers. Hopes which cannot be fulfilled will be generated by such fantasies, and resources will be diverted from the immediate and desperate task of recruiting and training teachers. Machinery, no matter how sophisticated, is not a substitute for counselors, personal guidance, emotional encouragement, and a general sense of social fraternity and community concern.

But we have an educational system which today must meet the needs of a citizenry that is mobile, physically and culturally. Our schools cannot be used to perpetuate cultural or psychological segregation. And we also have an educational system which will be, for a long time to come, under intense pressure to dilute standards and to lower the general social conception of the meaning of a good performance in any field. I need not dwell on the reasons for this: they are well known. The most important is that our educational system is unimaginably underfinanced and undermanned, even while tasks are being imposed on it such as no society ever imposed on its schools before.

Our schools need to define and transmit standards in two senses--standards that transcend local horizons and standards that can protect education against spreading weariness and mediocrity. It is in serving this function that I see one major role for national systems of educational telecommunication. The artful use of television can bring the best teachers into more classrooms and can reduce the distance between the opportunities available to different sectors of the population. Computerized libraries and other such developments can enhance the resources of the smaller and poorer schools and give them more of a share of the intellectual wealth. To perform the task of setting standards, however, telecommunications have to develop a kind of talent that has not been in plentiful supply, in part because the point of view toward the uses of telecommunications has been limited. The major effort in telecommunications should be in the direction of liberalizing education, and not in the direction simply of improving technical training.

A second long-range function of telecommunications is in the easing of what I have called the "communications glut." We suffer, in our society and in most other societies, both from too little communication and too much. People do not hear about what they should hear about, and yet they hear a good deal that is merely distracting or bewildering. Everyone is in this position--highly trained investigators, teachers, specialists in most fields, citizens, the young. It is the source of basic economic and political problems within our country and in the relations between countries in the world at large.

Yet, to a considerable extent, the problem can be alleviated by the systematic use of the technology of telecommunications, particularly the computer. Information does not reach the person who needs it for three main reasons: the prospective informant does not know where it is; the prospective recipient does not know what he needs; or he is inundated in a torrent of information so that he cannot find the particular bits of information useful to him. But it is possible, through computers and other means, to develop user-controlled instrumentalities for the distribution of information. Teachers can be supplied with what they need, students with what they are looking for. Information would thus be put in its place, and people would be trained in how to find it. Education could dwell on the harder questions: what information to look for and what to do with that information when it is found.

What stands in the way of the development of such user-controlled information systems is not technological inadequacies but human habits. We continue to look upon the relation of information to education in the way that people looked upon it when there was no easy way of finding the facts unless

they were stored in one's mind. Despite the talk that has gone on for years to the effect that the function of education is to teach people how to think rather than to cram insignificant facts into their minds, much education still goes on in the old paths. If for no other reason, I find the development of telecommunications a promising event because it may force teachers and educators to distinguish more constantly and sharply than they have in the past between the kind of fact that makes people think and the kind of fact that can lie in a public storehouse until it is needed.

Once again, it is important to see precisely what is at stake. A user-controlled information system, one that has a profile of the user and that feeds him the facts he needs when he needs them, serves only a limited purpose. It does not replace, though some seem to think so, the classical function of the school, which is to transmit certain facts to students apart from any of their needs of which they may be aware. To teach people how to think is not possible unless they have something to think with and about. Facts may not be ends in themselves, but no one can do any solid thinking unless his mind is furnished with them. Moreover, apart from the individual's own needs, a society needs to assure itself that its members share some common fund of information.

But the largest reason for saying that a user-controlled, individually tuned information system is not a substitute for an educational system that imparts general information is that general information has values which cannot be codified in a profile of the individual's existing needs and interests. If he has a specific problem and needs a specific bit of information to solve it, a well-organized information system can provide it to him speedily and easily. But the function of such a system is precisely to free his energies and time for the study and retention of kinds of information that have a broader purpose than solving a special problem.

There is information which is useful in dozens of contexts; there is knowledge which stirs the emotions and reorders the workings of the mind; there are facts which lie in hidden recesses of the memory but which nourish thinking, or turn up suddenly as elements in new mental constructions. A computer helps when one knows one's need or purpose. It has a precise function. But the educational function of the computer is to free teachers and students to dwell on intellectual materials that have plural values--that fill a variety of purposes, potential as well as actual, desirable as well as actually desired. To say this is to indicate not only the limits but the significance of information technology in education. Its major

significance is that it can be used as an instrument for releasing education from triviality. The information glut makes it imperative, and the new technology makes it possible, for educators to deal with a subject they usually like to postpone: What information ought people to store in their own minds? What information can we leave in books and libraries, to be used when we need it? The new telecommunications cannot answer these questions. Educators have to, on educational grounds. And telecommunications will be misused unless these questions are seriously explored. For telecommunications are not simply more efficient ways to achieve accepted purposes. They throw old purposes in a new context and make new purposes possible as well. They invite reflection on our purposes, therefore, and not only on our techniques. They require philosophy, not merely engineering.

But these considerations bring us to the use of telecommunications to help the schools meet the expanded social responsibilities which they must bear. These responsibilities are a product, on the other side, of the emergence of new values, new demands and needs, which must be met in some way unless our society is to sink into a pit of permanent self-alienation and self-distrust. Let me say a little--inevitably, it must be too little--about each of these.

Technological innovation has had the effect, I suggest, of greatly reducing the effectiveness of older forms of social education. New inventions lead to the displacement of people with established skills; but people cannot be retrained to the new technology, as in past societies, simply by learning the new skill on the job. A more formal kind of instruction is needed. Again, technology has led to the depopulation of rural areas and to the enlargement of the modern city with its floating populations. With its companion, urbanism, it has loosened established neighborhoods and community ties. In recompense, it has increased their dependence on large, centralized bureaucratic structures, and their openness to the influence of massive and shifting national styles in dress, morals, or personal ideals.

Still further, the accelerating pace of technological innovation greatly quickens the general social sense of instability and radical social change. The everyday content and context of human experience are altered; new generations feel themselves shut off from the perceptions and ideas of their elders, and older generations feel they cannot comprehend the newer generation. A sense of foreignness, of the presence of another perspective, almost another language, comes down like a curtain between the generations. In

France, young people have a slang expression for adults--they call them **amortis**--amortized, written off, finished as sources of any good bets or investments on the future.

For such reasons, and for many others that are connected with them but that I do not have time to mention, formal education is today required to undertake tasks which it could take for granted in past ages. Unless social discontinuities, dislocations, and instabilities are to grow, the educational sector of society must gradually take over functions once performed by other sectors informally. Education, in some form, has to take up the social slack--educating and reeducating adults, providing a basis for the consolidation of communities, creating conditions under which the young and the old can communicate to better effect.

In the form of mass entertainment, television has already come to serve such a function, in a way. It has given our society common spectacles, common news, common distractions and anodynes. But none of these creates communities in an active sense. Telecommunications, so far, have increased the net sum of passivity and individual isolation. If we look at the record of the past--if we judge our prospects by examining what our society has asked telecommunications to do, and what the telecommunications specialists have in fact done--there is reason for pessimism that our society can do what it needs to do.

Yet it should be plain that there are rising in our society moral, political, and esthetic sentiments profoundly at variance with these tendencies. To speak of the "new politics" is to speak of something still inchoate and confused. But it speaks for discontents and fears--and for conceptions of social harmony and security--that are rapidly growing. The old welfare politics, the old reformist liberalism with its dependence on a centralized state, the older economics of individual affluence and public poverty are all in retreat. Perhaps a case can still be made for them; but it is a cold, cerebral case, and it no longer seems to the point. The most demanding among us, no matter where we put ourselves on the political spectrum, have begun to speak for values that have an old, familiar ring, but that have been regarded, until recently, as too anachronistic to be sought in an industrial society: fraternity, not merely individual opportunity; participation in collective affairs, not merely personal security or comfort; the opportunity to talk back to the system and get a response, and not merely the right to hold a private opinion.

It is easy to say that all this is quixotic, dangerously unrealistic, a utopian effort to stem the tides of bigness, bureaucracy, and impersonality that are moving mankind toward its future. No doubt much current protest is merely a form of intellectual and emotional Ludditism--an impulse to smash what one does not understand and cannot accept. But what needs to be emphasized, I think, is that these emerging values are less anachronistic than they seem. They are less anachronistic, indeed, than are the values of those who hold that the post-industrial age--the emerging technotronic age--automatically requires us to go down the road of massive organizations and bureaucratized social relations. The productive capacity of modern economics, the powers available for rational planning, and, in particular, the resources of telecommunications all make it possible to achieve, within a technological framework, a good part of what these new values call for. The problem is severe; but it is political and ideological, not technical or economic. In the most long-range sense, indeed, it is an educational problem, and it is in and through education that the first steps can be taken to deal with it.

When information and instruction can be sent quickly and economically to all parts of a country, it is no longer necessary to collect people together in universities, factories, or other collectivities as vast as those that now exist. Agglomeration is not a condition for coordination, and has become, indeed, an obstacle to it. If teachers can get the book, picture, or personal report which they require to make a classroom come alive from a distant place, and can do so with a fairly simple signal, the student's sense of his environment is changed. It becomes something not simply to be adjusted to or passively accepted; it becomes something to be manipulated, expanded, and enriched. The conquest of distance is no longer a technical problem; one can concentrate on its more difficult features--emotional and intellectual distance. And if a community struggling with the problems of managing its school can reach people in other communities in televised conversations, if it can shop for expert advice without being dependent on a single bureaucracy, it has resources that give substance to the hope that, even in a highly technical and specialized era, citizens can educate themselves sufficiently to take responsible charge of their immediate community's affairs. Telecommunications, rightly used, can give us some of the advantages of centralization along with some of the benefits of decentralization.

The overhanging question, in brief, is whether telecommunications are going to be used to help build a humane civilization on a technological base. Social and educational structures need to be reformed

if telecommunications are to realize their educational potential. Telecommunications can be used to help that reform along, but they can also be used to cement the existing inadequate structures in place. Which happens depends in part on the responsiveness and sobriety of educators and citizens in the face of the new telecommunications. But it also depends in good part on whether telecommunicators choose to think and act as technicians and salesmen or as educators and political beings.

THE CORPORATION FOR PUBLIC BROADCASTING*

Ward Chamberlin

In the words of the Carnegie Commission, public television is "all that is of human interest and importance which is not at the present moment appropriate or available for support by advertising and which is not arranged for formal instruction. . . ."

The Corporation for Public Broadcasting is an independent, nonprofit corporation established by Title II of the Public Broadcasting Act of 1967 with a board of directors consisting of fifteen persons appointed by the President and confirmed by the Senate. The board by legislation must be composed of members with equal representation of the two national parties. The corporation is to receive both public and private funds, and its function is to establish and to aid in the full development of noncommercial, educational television and radio in the United States. Specifically, it is to create and to assist in the creation of high quality programing for distribution to local stations, to establish and develop one or more systems of interconnection for the distribution of such programing, and to strengthen the local stations. But mainly the corporation is a leadership vehicle. The hope of its sponsors is that it can provide a rallying point for all of the diverse elements of public television and provide leadership in a way that will inspire confidence not only in its constituency of public television stations and those citizens who contribute time and money to support them but also win the confidence of its sponsors, the Congress of the United States. For it has become clear that to make public television a really important force in this country, to make it a real supplement to commercial television fare, private funds will not be enough.

Where does the corporation stand, seven months after it was formed and about two months after the first appropriation was voted? There are two achievements to date that I would like to mention: we have already played a leading role in making arrangements with the American Telephone and Telegraph Company for public television's first network service or regular interconnection service. A trial period at

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*Ward Chamberlin, general manager of the Corporation for Public Broadcasting, addressed the luncheon meeting on Thursday, December 5.

much reduced rates will interconnect about 150 stations from 8:00 to 10:00 p.m. Sunday through Friday. This will also permit a beginning of regional programing. For in part of that time we consider regional and local programing an absolute essential. This is a major step, not only in obtaining reduced rates but in providing public television with an opportunity for simultaneous programing around the country. Fred Friendly likes to describe this as an "electronic turnpike" with entrances and exits for the local stations which don't have to take any programs that they don't want. And, in time, they too can feed into the regional and national system. Ambitious? Yes, but it is within sight. The problem of rates is not solved; this is a trial period. We have to work on this as we go along, but we've made a first step.

The second result on our balance sheet is the program which the corporation outlines for its first year. Some elements of this are worth mentioning: first, a basic grant to each television station licensee which will enable that station to become more deeply involved in the affairs of its own community. This establishes a direct line between the station and the corporation, and we hope that it will enable the station to do something significant in its community which it would not otherwise be able to do. Furthermore, we'll support specialized programing efforts, hopefully to focus on timely public affairs subjects, in supporting NET and other production by certain stations in this regard for public affairs programs which can be shown on the national network in prime time--for example, perhaps the Senate hearings on the confirmation of Mr. Nixon's Secretary of State.

Secondly, we'll hope to support programs that will analyze in depth a few of our contemporary problems, urban and rural. Television as it has developed gives so little real information, so little basis for the citizen to understand beyond his own situation what are the real alternatives. We'd like to show by public television, as NET has already done in many instances, that first-rate production, unhampered by the time element that dominates commercial TV, can be a major factor in illuminating some of our problems and also in obtaining a better perspective on many of the fine things that are going on in this country. We'd also like to continue to spark innovation in what might be called cultural affairs programing. After all, in public television we are not, or we shouldn't be, dominated by the "ratings." Of course, we should be concerned about how many people, and the kinds of people who are listening, but we should cater to many smaller audiences and promote the tastes of many segments of our society to increase those audiences. The

British Broadcasting Corporation has a motto which it is well to keep in mind: "To make the good popular and the popular good."

Finally, we will support programs for the preschool child and for the adult who wants a continuing education.

On the other side of the balance sheet the problem is still there: how to obtain and on what basis to obtain long-range, substantial federal financing for public television. To do this the corporation must have the enthusiastic support not only of its stations but of all the elements in the educational community. Such support would constitute a national decision that we all want another option when we turn on that television set.

INFORMATION SYSTEMS FOR THE FUTURE*

Jordan J. Baruch

We have long been accustomed to two basic types of information systems in this country--the common carriers and the broadcast services. Now we are within sight of a third system, a kind of hybrid of these two, which we might call extended broadcast or interactive television.

The common carriers, such as the post office and telephone and telegraph companies, are engaged in point-to-point communication services in which the content of the messages is not the responsibility of the carrier. The user has full responsibility for the content; he uses the facility in complete privacy. The carrier provides the service of point-to-point communication without discrimination to all users who are willing and able to pay for it.

In the broadcast services, on the other hand, there is no privacy or point-to-point communication. By its very nature the broadcast is receivable by the public, and the content of the transmissions is very much the responsibility of the broadcaster. The service is one-way, outbound, so to speak, a mass coverage intended for the entire group of public viewers or listeners in a given area. Apart from occasional telephone calls to the broadcast stations, this service is without direct concurrent feedback from the audience.

Now it is within the state of the art to provide for our country a third great system of communication which would combine certain features of both of the earlier ones. It would make possible two-way or interactive television and broadcasting. The individual would no longer be in a receive-only mode with regard to his television set, for instance. He would be able to react to it by pressing a button which would register a response from him at the originating center. That center would be able to recognize the signal from his individual set, record it, and respond to it in an individual way. The technological

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*Jordan Baruch, president, Interuniversity Communications Council (EDUCOM), addressed the second meeting of the commissions. The taperecording of his speech was inadvertently erased, hence this brief summary is reproduced as a substitute for the full text.

developments which make this system possible are the computer, random access data files, and image converters which would equip our television sets to display and hold still slides from a central source as well as file response information and requests from the user.

Such a system would make possible a process of what might be called broadgathering and narrowcasting. Responses from a broad section of the public--perhaps as many as a million sets--could be assimilated within a few seconds, and the answers from the central computer and files could go back addressed to the individual sets. The uses to which such a system could be put would include both public and private or commercial ones.

The public uses of the system would clearly be of great political and educational significance. The polling of votes from citizens would no longer be a lengthy process. It would be possible to register almost instant information on the response to any public question from a large part of the population. Educational programs could have a constant measurement of their learning impact. In fact, such programs could greatly extend their scope by introducing the benefits of computer-assisted and computer-managed instruction where formal learning is involved. The individual user could proceed at his own pace, reacting to branching programs and slide shows, engaging in problem-solving activity by use of the computer, and even requesting the print-out or library material as necessary. News summaries could be made available to the public on call, and there would be many computer-based services which could be extended to the general public at very small cost: such things as the computations of individual income tax returns or citizen access to central indexes of art or cooking menus.

The commercial uses of the system would also be very extensive. Interactive advertising would not only strengthen the impact of the commercial message but would also give very valuable information to the advertiser regarding his cost-per-thousand. The slide resources of the system could make possible a kind of enormous extension of the Sears, Roebuck catalog--by which the user could quickly consult an index, see pictures and descriptions of the items available, and even file orders by means of the response buttons. Banking and credit card transactions could be simultaneously correlated in the central computer.

The areas in which we might see the beginnings of such a system are those in which the great expansion of CATV cables makes large numbers of extra channels available, areas where there are also

important computer installations already in existence, and areas where major universities and ETV production facilities are operating. We have already seen hints of the things to come in some of the present networking activities of the Poison Control Center, the Lister Hill Center for Biomedical Communications, The National Agricultural Library, Chemical Abstracts, and the Library of Congress MARC-II System. Even at the state level there have been many inconspicuous networks developed, such as public safety and motor vehicle registration networks. What we need most of all at the national level now is a national commitment to develop the full potential of this interactive communication system in an orderly way--implying organizational, regulatory, and technological activities. The cost of the system might well be borne by a combination of public and private, commercial investment. But we need the national commitment and the policy decisions to work this out.

CABLE TELEVISION*

Frederick W. Ford

No two segments of the telecommunications industry have more in common, more in the way of mutual interests, than educational broadcasters and cable television operators.

Cable television is proud to have played a role in the development and growth of ETV. And educational broadcasters should be no less reluctant to take credit for the fact that, in many communities, ETV programing has made a significant contribution to the public through CATV.

Service to the community and support of educational television have been bywords in our industry almost from the day of its inception in 1949. That attitude isn't being recounted here to suggest that we have done anything more than any forward-thinking, public-spirited industry should be expected to do.

What is unusual, I believe, is that an industry as young as ours has accepted its responsibility with the complete dedication and unrestrained enthusiasm we have shown. Moreover, it should be recognized that these are self-assigned responsibilities––to undertake any and all public service projects to which our business is technologically adaptable.

A cable television system may serve the educational needs of its community in any of the following ways:

1. Carrying the signals of one or more educational television stations to citizens of the community who would otherwise not receive them.

2. Providing connections and multiple outlets to local schools, enabling the teachers to make use of educational and commercial programs in the classroom.

3. Providing a channel through which educational programing originated by a local school or educational agency may be distributed to the entire school system and the community.

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*Frederick W. Ford, former chairman, Federal Communications Commission, and president, National Cable Television Association, addressed the second meeting of the Commissions.

Let me give you the results of a recent study we conducted of the activity of CATV systems in aid of educational television.

A tabulation of Federal Communications Commission records identified ETV stations carried by CATV systems; to determine the extent of activity under points two and three, NCTA mailed a prepaid postcard to all of the operating CATV systems––roughly 1,800. We received 416 replies. In many instances we also received letters amplifying the service to educational television being rendered. The results were most gratifying.

Swiftly, quietly, and **without subsidy of any kind,** the cable television industry has become a major factor in the distribution of educational programing. Perhaps even more significant, there are clear signs that it is becoming an important **source** of educational material.

Briefly, FCC records indicate that the **carriage of ETV signals by CATV systems has increased 673 percent since 1964** (the last time NCTA surveyed the practice). During the same period of time, the number of ETV stations on the air has increased only fifty-four percent. There are 719 CATV systems located in forty-five states distributing the signals of ninty-four ETV's––seventy-three percent of the nation's educational television stations.

And where there is no local educational television station, the CATV's are stepping in to fill the breach. Forty-four systems are now serving their communities with educational programs **originated over their facilities** by a local educational institution, and eighteen more have announced their intention to do so in the near future. (These sixty-two systems were tabulated from the 416 replies to the postcard questionnaire––we have no way of knowing if the results are projectionable to the remaining three-quarters of the cable television industry, but it seems a reasonably safe assumption that we are far from discovering all examples of the practice. The respondents alone are carrying educational material to 940,778 students in 2,004 schools.)

These facts indicate two things: first, that the CATV operator is concerned with the welfare of his community and anxious to undertake those public service projects to which his business is technologically adaptable; and second, that beyond any doubt CATV has proved its ability to make a major contribution to the distribution of educational programing.

To be frank, we were, ourselves, surprised and gratified by the results of this survey.

Of course, slight differences have existed from time to time between ETV and cable interests. But the nature of these differences has been over which of several avenues is likely to offer the most effective means to accomplish our joint objectives--not over the objectives themselves. And foremost among our joint objectives has always been--and continues to be--the further development and widest possible dissemination of educational TV.

To the end that our respective efforts in this direction are fully coordinated for maximum utilization of available talent and resources, the staffs of the National Association of Educational Broadcasters and NCTA recently held the first of an anticipated series of meetings. From this initial meeting came a better understanding of our mutual problems and a firm resolve to work out the solution to these problems in an atmosphere of enlightened cooperation and progressive accord. At this meeting the following tentative program was decided upon:

1. NCTA would prepare a letter to their members on educational television.

2. Each of the two associations would designate a liaison officer between the two organizations.

3. The Educational Television Committee of the NCTA would become more active.

4. We would jointly attempt to set up a local liaison committee between educational television broadcasters and CATV operators.

5. We will include in the NCTA kit for new operators a description of the machinery to be employed in order to avoid friction.

An additional subject of mutual concern is the copyright legislation.

Broadcasters have a problem with the provisions of the copyright bill which would be somewhat restrictive. So do we! We are extremely hopeful that the solution adopted for educational television will permit us to continue to help deliver the fine public service it renders. I hope we will be able to assist in the delivery of programs between schools or to the public without additional copyright fees. Frankly, I am fearful of the consequence of letters some operators have been receiving from television stations telling them that they would like their signals to be carried but copyright owners require them to advise that

certain programs must be deleted. If such a practice becomes general, the economics of copyright could prevent us from rendering the service we are prepared to provide.

With the programs I describe we hope we will be successful in obviating friction. Perhaps the Congress in its wisdom will permit us to continue to offer this service. If proper copyright provisions are not enacted into law, it could have a serious impact on our ability to continue our present service or to expand it in the future.

As to the future that I foresee for cable television, I do not believe that the present state of the CATV art, the urgent frequency demands, nor the huge expenditure which would be required justify a program, even with unwanted government subsidy, of attempts to transfer all television or any substantial part of it to cable. Some vague idea of the cost of an all-wire television plant can be gained by considering the book cost of domestic land line telephone companies of 47.3 billion dollars, as of December 31, 1966. Whereas, the original cost of tangible television network and all station property, as of the FCC Annual Report for 1966, was one billion dollars.

There is no justifiable reason to move to an all-wire television system precipitously or in the foreseeable future. No one has pointed out to me any public interest reason for such an action. Wire systems will grow and expand rapidly once freed of the present FCC artificial restraints and will render a fine public service, but I am not aware of any public need which would justify the dislocation of the television industry or even of noticeably altering its structure. I believe our network and station system is sound and must be preserved, but I believe this can be done simultaneously with the full development of cable television for the benefit of the public.

The present state of the art of cable television does not yet permit it to serve 100 percent of our population economically. If we could serve 100 percent of the population, I would be opposed to any greater regulation, although of a different kind, than that imposed on newspapers simply because we do not use any appreciable amount of spectrum space. The shortage of spectrum space is the principal reason for the regulation of television, but there is no shortage of wire and most of our franchises are on a nonexclusive basis, just as newspapers are. There are some limited exceptions to this position, such as political broadcasts and the fairness doctrine arising out of practical necessity because of our peculiar relationship to the broadcast industry.

In short, I foresee inroads on UHF frequencies to satisfy other national needs, but not to the extent of injuring our existing television system. Mobile radio, industrial and other commercial demands must have additional frequency space if our country is to grow and our gross national product is to be adequately increased. The increased efficiency introduced by the use of radio frequencies in commerce must be employed to full advantage in the national interest.

As I understand our national goal for radio and television, it is the greatest number of program services for the greatest number of people. Television stations cannot accomplish this objective alone, although they are and will remain the dominant system for national and regional program origination, but satellites and cable are new technologies which must be integrated into our mass communications complex.

In summary, I believe that ––

1. Our present television structure must be preserved as being of primary public interest.

2. Television station needs can be met without retaining such an extensive UHF frequency buffer zone to maintain an image of freedom of entry or of unrestricted competition.

3. Cable television systems help rather than hurt UHF stations in their competitive position with VHF stations.

4. Limited inroads on UHF frequencies must be permitted to the extent necessary to accommodate other national needs, but not to the injury of our television structure.

5. Cable television should be permitted to introduce greater competition between television stations by delivering distant signals and originating programs without limitation on advertising.

6. In order to achieve our national goal of the greatest number of program services for the greatest number of people, the new technologies of cable and satellites must be integrated into our national mass communications complex.

7. The transfer of television to an all-wire system is not needed in the foreseeable future because frequency needs can be met without the dislocation of television stations, and the inordinate cost of such a project is uneconomical and not justified by any public interest standard of which I am aware.

If this program, which is in rough form, is generally followed, I anticipate that these industries will move relentlessly and prosperously forward to a new and expanded era of audiovisual mass communications, and other radio-starved industries can share this precious natural resource for the further advancement of the public good.

AN EVALUATION OF TELEVISION BROADCAST SATELLITE SYSTEMS*

R. W. Hesselbacher

Of all the applications of today's space program, the Television Broadcast Satellite (TVBS) has the greatest potential for directly helping the peoples of the world. In its various forms, it can provide mass communications and education where there are none, extend and improve them where they exist, and accomplish this more cheaply and quickly than any other means.

The purpose of the studies described in this paper is to define total systems which are optimized in terms of specific service needs and projected means of payment. Both the ground and space segments of the systems have been examined to assure that the economics could be evaluated in the proper perspective. Since the number of possible specific services is so large, a wide range of parameters had to be examined. *These included from UHF to 12 GHz, from $0 to $50,000* ground investment, and both AM and FM systems.

The services have been grouped into two major categories for this study: **Direct Service** is for use by the general public in the home. For this service the ground investment has been restricted to $0 to $150. **Special Service** is for special group viewing at a smaller number of selected centers, and for inputs to terrestrial broadcast stations. Here, the range of ground investment was $1,000 to $50,000.

EXAMPLE SYSTEMS

Three potential broadcast satellite services were selected as representative of the range of technical and service requirements: (1) a community distribution service to India, (2) a direct service to Alaska, and (3) an instructional service to the United States. These were studied to examine in detail the subsystem interfaces and designs. Descriptions of the example services and the key results of the design analyses follow.

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*R. W. Hesselbacher, manager, Communications Satellite Programs, General Electric Company, addressed the second meeting of the Commissions.

Community/Distribution Satellite for India

General System Considerations. This system would provide a greatly needed instructional, educational, and information dissemination service for developing nations. By providing a simple community receiving system (minimal operation and maintenance requirements), audiovisual presentation can be implemented rapidly by utilization of broadcast satellites. India is a good example of this type of nation since its population is clustered in villages and spread over a large area. Since this type of service is directed toward nations in which use of the RF spectrum is now minimal, the broadcast service parameters can easily be optimized on a cost-effectiveness basis. A distribution service, at 8.4 GHz, was added in this satellite to deliver signals to ground television stations in the major cities.

Cost Comparison. The worth of a satellite broadcast system becomes evident when the satellite system is compared to the cost to implement and operate a terrestrial microwave/cable relay link (the alternate approach to providing the TV services). The costs developed here for comparison are based on certain assumptions made to permit modeling; however, the results are felt to be representative of realistic situations. The model assumes UHF stations transmitting at an ERP level of 1000 KW from antennas 1000 feet above ground. The effective radius of coverage of the station is dependent upon the height above ground of the receiving antenna. The received picture quality is a function of the noise figure of the electronics and the gain of the receiving antenna. For these systems the receiver is assumed to be a standard TV set with no preamplifiers, and the antenna gain requirement is dependent upon distance from the station. Total system cost is a function of two elements: (1) the transmitting station installation and operation, and (2) the receiver installations.

Since the receiving antenna installation cost is proportional to the distance from the station (and thereby inversely proportional to the number of transmitting stations and their total cost), there is an operating point for minimum cost dependent upon the number of receivers. In general, the minimum total cost will occur by minimizing the number of transmitters required. This can occur through extension of the coverage radius to a practical maximum by installation of high gain receiving antennas on towers at the fringe areas. Therefore, the coverage radii were established to be fifty-two miles for a direct service to a home or community receiver and fifty-five miles for a special service instructional TV receiver. This is based

upon receiving antenna heights of thirty feet and fifty feet respectively. In addition to the coverage radius, the second element determining the required number of stations is the desired portion of the area to be covered. The models chosen for comparison in this study provide eighty-five percent for home/community coverage and sixty-five percent for instructional coverage. These values are considered reasonable for existing similar systems.

To provide the Grade 2 picture or better to the 1.1×10^6 square miles of India would require 110 transmitting stations spaced 100 miles apart. The initial investment cost would be $80 million for the microwave links and stations, and $10 million for receiving antenna installations (based on 260,000 of the 500,000 receivers requiring antenna gains varying from thirteen dB at fifty-two miles from the station down to about two dB at thirty-six miles). The annual operation cost would be about $6 million, and the total cost for a ten-year program would be approximately $150 million. The comparable ten-year cost for a community broadcast satellite would be $87 million based on a $50 receiver cost for the 500,000 units and $62 million for the satellite development and operation. Thus, the cost ratio of the terrestrial-to-satellite approach is almost two to one in favor of the satellite.

The payload for the distribution service was added to the satellite to accommodate anticipated needs of the major metropolitan areas as they develop their local TV transmitting facilities. The cost of adding this service to the satellite was relatively insignificant and is included in the cost data above. The additional cost of a ground station required to receive this service is about $3,000 when operating at X-band utilizing frequency modulation.

Direct Broadcast – To Alaska

General System Considerations. This service provides general purpose television to sparsely populated remote regions. The advantage of this type of service would be ready acceptance by inhabitants with available resources to purchase the needed equipment and provide maintenance. The example target area is Alaska; three channels are provided.

Cost Comparison. The terrestrial method of obtaining three-channel service to all of Alaska is similar to the method previously described for India, and requires sixty stations with 100 mile spacing to cover the .6 million square mile area. The initial investment would be about $90 million for transmitting

stations (assuming a cooperative use of transmitting facilities by the three channels), and $2 million for receiving antennas (based on 52,000 receiver installations requiring outdoor antennas with gain of from two dB to thirteen dB). The annual operating cost (which includes a leased microwave relay network) would be $23 million, a total ten-year program cost would then be about $320 million. The equivalent satellite system cost would be $155 million, based on a $100 receiver cost for 100,000 units and $145 million for satellite development and ten-year operation. Thus, the cost of the terrestrial approach would be more than double the cost of the satellite.

Instructional Television Satellite for the United States.

General System Considerations. This service would enable developed nations to supplement present educational methods and establish cultural/educational adult community programs. This would be done by utilizing ground receiving stations at discrete centralized locations, such as schools and libraries. High-quality teaching instruction could be provided for general and specialized subjects for schools or special interest groups, regardless of local resources.

This service is assumed to require twelve channels (six to each of two areas). Two beams would be provided to the United States during morning and early afternoon hours: one to the eastern region and one to the west. When the eastern daytime programing is complete, the power used for United States transmission would be switched and divided among two previously inactive antennas aimed at Alaska and Hawaii. Daytime instruction for Alaska and Hawaii would then be possible for five to six hours. Afterwards, power could be switched back to the eastern United States for evening cultural and educational programs.

Cost Comparison. Terrestrial methods of delivering the six-channel instructional TV signal are quite expensive. The model results in 211 stations at 119 mile spacing with installation costs of $610 million for the stations and about $.5 million for receiving antennas (based on antenna installations ranging from about twenty-two dB at fifty-five miles to about two dB at twenty-eight miles). Operation costs amount to about $67 million annually; the total cost for a ten-year program is then about $1.28 billion.

The satellite system would cost $6 million for annual operation of the satellite, $24 million for satellite development, and $11 million for receiver costs for the 10,000 installations. This amounts to a ten-year program cost of about $95 million. Thus, the satellite approach is less expensive than the terrestrial by a factor of about thirteen.

If the systems were designed to reach all of the 100,000 schools in the United States (instead of the 10,000 school districts assumed), the satellite system cost would increase more dramatically than the terrestrial system: $100 million compared to $5 million for the ten-year program. However, the cost ratio would still be about seven to one in favor of the satellite system and a full 100 percent of the area would be covered.

CONCLUSIONS

These investigations and others have clearly shown that broadcast satellites are cost effective for the whole range of potential applications in both direct and special services.

It is important to note that even in cases where the signal is not aimed at direct reception in the home, there is no economic basis for the choice of high-cost ground receivers and low performance satellites. Available technology can provide high-power satellites and low-cost ground receiving terminals. This makes broadcast satellites economically available for improved education and exchange of specialized professional information in developed areas, and for fundamental educational and cultural efforts in developing areas.

Development of key elements of high-powered broadcast satellite is in process. Ground converters are being defined and solar array power system development has been underway for many years. High power transmitters and special antennas are being designed, and experience gained on current space programs is being applied to problems of control of large flexible vehicles and long life in space.

The high powered broadcast satellite should be an integral part of total communications systems that will use both space and terrestrial elements to maximum advantage. The technology advances generated will also be applicable to the improvement of efficiency and economy of terrestrial systems.

There are many politico-technical problems associated with space broadcasting; however, none of them are unsurmountable. As the public becomes more aware of the benefits of this application of space technology, many of these problems will disappear. Steps should be taken now to create an environment that does not preclude making these benefits available to the peoples of the world.

THE PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY*

Leland L. Johnson

Since the report of our Task Force has not as of the date of this conference gone to the White House, I cannot reveal to you any of our recommendations, but I can give you my own personal views on some of the problems that we considered.**

Engineers have now figured out a way of stabilizing the antennas of satellites while the satellites themselves spin. With the antenna now pointed toward the earth the transmission energy can be concentrated into narrower beams--perhaps the width of one time zone in the United States. With such concentrated beams, it is possible to begin to think of ground stations much smaller and less sophisticated than in the past, costing by the early 70s several hundred thousand dollars instead of several million. A very large capacity can be built into these narrow beam satellites, and the additional cost of increased capacity is rather small. The question then is what can the large capacity be used for?

One of the most difficult problems has been to determine what kinds of demands there are in the educational community for the real time transmission that satellites or some other technology would be able to provide. Who can say that by 1970 there will be a requirement for eight channels between, say, Salt Lake City and Los Angeles?

What about the other conditions? Is it important that education have continuous, twenty-four hour service, or is it really prime-time service that is of great concern? Daytime service for classroom purposes? Or is the kind of service that we need one which can occasionally be interrupted, if necessary, when commercial operations have a breakdown and are forced to preempt some of the capacity?

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*Leland L. Johnson, director of research, The President's Task Force on Communications Policy, addressed the Second General Assembly.

**The report from the White House has been made and is now available. Final Report: President's Task Force on Communications Policy. December 7, 1968.

There is at work an interactive process, on one side the new technology evolving and on the other side the people who are trying to think about how to use that technology.

Satellites should not be considered in isolation from other distribution purposes. There have also been spectacular breakthroughs in the use of coaxial cable during the past decade, and microwave technology is certainly not standing still.

Many people have asked in the past, "What is unique about a satellite?" And the answer is, "nothing." Satellites offer some possibility of reducing channel costs for some applications——over very long distances the advantages of the satellites are particularly marked; over shorter distances, much less so. In some cases the costs of using terrestrial means of distribution are less.

Even in the case of direct broadcast satellites which would be feasible in the early 70s, we have to balance the cost of choosing that way against the cost of ground-based systems.

In the case of a country like India, however, where terrestrial facilities are essentially nonexistent, the comparative advantages of direct-broadcast satellites become radically different.

NASA will place in orbit over India in the early 70s an Advanced Technology Satellite which, among other things, will include an experiment in direct satellite broadcasting. Antennas costing from $200 to $500 will be erected in scattered villages, and for the first time many villages will have real-time links to a central studio. This will require the local people to think about how they are going to use this resource. As long as the satellite exists only on paper, they never get around to this kind of thinking.

Regarding computers, my own view is that one runs out economies of scale at some point. One can visualize a giant computer located in the middle of the country with real-time links to all points, but it turns out that, even if the transmission were free, the cost of such a large computer relative to the costs of computers placed in the various metropolitan areas does not appear very attractive. There have been breakthroughs in large computer technology, to be sure, but there have been breakthroughs also in the technology of small computers. The real worries have to do with questions of terminal costs. Even if the links were free——and the computer, as well——today the terminals are fairly expensive, costing many hundreds of dollars each. Our estimates are that by 1980 computer-linked instruction might cost about sixty cents per hour per student, which is much less than it is today. But this is somewhat more expensive

than conventional elementary instruction, although less expensive than instruction in higher education. The question immediately arises as to the quality of computer instruction as compared with conventional methods. If it compares favorably, it is reasonable to expect rapid evolution of computer-linked instruction aimed at higher education applications. And if it is really markedly superior, it might even compete at the elementary level. But the quality aspect is one that has very much eluded us. It will be up to individuals such as the participants of this conference to perform experiments on this.

Cable television is growing rapidly and is a very attractive medium insofar as it is possible to add additional capacity to the cables at very small cost.

REPORT OF THE PRESIDENT'S TASK FORCE FOR EDUCATIONAL COMMUNICATIONS BY SATELLITES*

Robert B. Hudson

The President's Task Force policy recommendations for communication by satellites as of this very date are unknown, although, like most secret documents, there is some informed speculation about them. As in Plato's cave some shadows can be read. The shadows with the sharpest lines are those that derive from the nature of the questions that the task force was asked to consider. Questions themselves have a way of delimiting a subject, thus reducing the range of answers.

When President Johnson appointed the task force on August 14, 1967, he directed it to examine four major questions:

"Are we making the best use of the electro-magnetic frequence spectrum?

"How soon will a domestic satellite system be economically feasible?

"Should a domestic satellite system be general purpose or specialized, and should there be more than one system?

"How will these and other developments affect COMSAT and the international communication carriers?"

We have already heard from Leland Johnson, who is a member of the task force staff, about some of the ponderables on the uses of the spectrum, the economic feasibility of domestic satellites, and some observations about general purpose versus dedicated systems, and how these decisions might affect INTELSAT and the international services. For the purposes of this discussion we can bypass the task force

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*Robert B. Hudson, senior vice-president, National Educational Television, reported to the Second General Assembly.

recommendations regarding spectrum uses and concentrate on the satellite problems and their implications for educational broadcasting.

INTERNATIONAL SATELLITES

The international satellites hold interest for education even though educators and educational broadcasters have scarcely been involved in this development. The Congress set up COMSAT in 1962 as the United States' chosen instrument in a global system of commercial communications. Then came the INTELSAT agreement of 1964 which created a consortium of fifty-eight nations that jointly support the development of a global system of communication satellites to make modern communications available to all nations. COMSAT serves also as the management arm of INTELSAT.

We speak knowingly of the Early Birds and the Lani Birds, and we are accustomed to seeing televised news reports transmitted from abroad via satellites. But the President went beyond the reaches of our daily experiences and asserted that this new technology has greater potential, that it stirs our imagination as we think about what it can do. For example:

> "Schools of all lands can be connected by television––so that the children of each nation can see and hear their contemporaries throughout the world.
>
> "The world community of scholars can be brought together across great distances for face-to-face discussions via satellite.
>
> "Global consultations, with voice and pictures, can bring great specialists to the bedsides of patients in every continent.
>
> "The art, culture, history, literature, and medical science of all nations can be transmitted by satellite to every nation."

The President also mentioned commercial telephone service and international commerce, but his emphasis was on education, science, and culture. It is a pretty picture of the communications world to be, but where are the educators who are setting out to implement it? Furthermore, is education really interested? Except for a couple of transatlantic exchanges between schools, I know of no involvement on

the part of education in satellites and their potential international uses. A year or so ago NET and the BBC brought together via satellite a junior high school class in Newton, Massachusetts, with one in Birmingham, England, for a lively discussion, but that should be regarded more as a demonstration than as a prototype for things to come.

So long as we are restricted by the technology to **distribution** or **relay** satellites––satellites that can only link sophisticated and expensive originating and receiving ground stations––the home nation ground station along with the television networks are the gatekeepers of programs. They will determine the nature of the transmissions. It won't surprise you to know that the European members of INTELSAT were astounded a year or so ago when President Johnson suddenly decided that he would speak to Europe! The French suggested reciprocity for President de Gaulle, but I don't recall what COMSAT and the U.S. networks replied.

The real problem will arise when the state of the art advances to the place where **direct** satellites will relay broadcast signals directly to home and school. Reception on ordinary TV receivers will require a relatively inexpensive antenna system. Satellites with power supplies adequate for home set pickup have been designed; they await only orders for them to be built. They could be in operation as early as 1970. When they do become a reality, the United States could broadcast directly to people in Europe or Latin America without any intervening gatekeepers. And the Soviet Union likewise could broadcast directly to us.

If the schools of all lands can be connected by satellite-assisted television, and if the community of scholars can be brought together across great distances, the question that confronts us is this: what kind of international consortium of education must we have? Should INTELSAT have a sub-program committee made up of educators? Could it, or can we, program this new resource into our respective educational systems? What steps should we take now to prepare ourselves?

In short, in this new system of international communication, who in the United States speaks for education? Surely this is not the province of the USIA. But we have heard nothing from the American Council on Education, or the National Education Association, or the National Association of State Universities and Land-Grant Colleges. Perhaps we should look to a revitalized JCET which represents major national educational interests.

A TELECOMMUNICATIONS POLICY FOR EDUCATION

It seems to me that we are here to develop a telecommunications policy for education. We are here not only to assess the progress of sixteen years of ETV and ITV and PTV but to assess opportunities beckoning. It was my good fortune to be at Penn State in 1952 for a similar meeting, held under the auspices of the American Council on Education, from which emerged a television policy for education. The broad policy lines laid down at Penn State have served well up to now. Television was new then and it confronted educators; a wider technology is new now and it, too, confronts educators. As we soon discovered in television, acquiring and operating the hardware is merely the first problem; the software problems are without end. Now, with new technology, first we ask, is it ready for us; then, are we ready for it? What technology and how to organize to use it effectively for the benefit of school and adult populations are our twin problems as we are given access to communication satellites, multichannel television, computers, knowledge banks, carrels and all the rest. In some ways, the forthcoming report of the Commission on Instructional Technology* may give us more guidelines for software than that of the task force under discussion. That report will come later; the satellite question cannot be long postponed. In dealing with it we are dealing in futures. Some people have said that the present state of the art, **distribution** satellites which feed television stations, at best provides only for more interconnections. But interconnecting systems, be they satellite or terrestrial, are measured in terms of cost, reliability, and parameters of service. Where there is a choice, the decision rests on those measurements. That is the short-range view.

The real futures we are talking about insofar as satellites are concerned lie in the next stage of the art, in the era of **direct** satellites. Through them can be served the home and school, the library, and the laboratory. People everywhere will have direct access to voice, picture, facsimile, and data in all their combinations and variety. It is here that education's stakes are highest.

Regardless of what the report of the President's Task Force on Communications Policy says about domestic satellites, we know we are confronted as educators. Only the opening guns have been sounded in

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*A review and summary of the report of this commission has been prepared by C. R. Carpenter, a member of the commission, and is given in the Appendix.

the struggle for position, and we are going to be called upon in the months and years immediately ahead to lay claim to a part of the "people's dividend." It is well that we are here to develop policy for education. It will be well also that we take some steps to implement that policy.

During the early wars for a place in the TV spectrum, education's efforts were coordinated by the JCET——the Joint Committee for Educational Television. After ten years that job was done, and the JCET became more or less dormant. Now, once again, education is faced with important new decisions as it addresses the new technology, and once again a coordinated approach is indicated. Perhaps the JCET——renamed the Joint Council on Educational Telecommunications——can rise like a phoenix and show the way.

PANEL DISCUSSION*
AT SECOND GENERAL ASSEMBLY

John R. Pierce: To me, the technical problems of satellites, although complicated but straightforward, seem less difficult than the problems of providing really economical switching equipment, terminals, and local transmission.

The picture-phone, although a fewer number of lines resolution than television, will come into use during the 70s and will be one sort of terminal that will be standard, highly reliable, and, we hope, not too costly. How can this be used in connection with computers and education? This is something people should think about.

John F. White: Here, once again, we're spending a great deal of time talking about hardware. We might have done well to have representatives from Raytheon, Xerox, General Learning Corporation, and a few others to tell us the error of our ways. Those of us who have worked with film know the problem. We've been at it for thirty or forty years, and never have we been able to develop, really, the utilization of this most potent tool as an instrument to be used universally in instruction. It seems as we talk about these new technological developments, if we are going to avoid hobby shops, we'd better start talking now about what we are going to do with them.

Robert B. Hudson: I am reminded of an occasion about a year ago when I was in India on a UNESCO mission. We traveled outside of Delhi to a television farm forum. When we got to the village square, we found a twenty-one-inch television set mounted under the arch of a building. Crowded into that square were something over a thousand people, as many of the villagers as could get in––the farm forum group in front, the young boys next, the ment next. The women were there in left field, and on the right

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*Panel members were John R. Pierce, executive director for research, Communications Science Division, Bell Laboratories and chairman, President's Panel on Computers in Higher Education; John F. White, president, National Educational Television; and Robert B. Hudson, senior vice-president, National Educational Television. John W. Meaney was panel moderator.

side were girls carrying babies on their backs, the baby sitters. The point was that television had come to town, and I suspect that it supports McLuhan because the environment was changed, something new was added quite apart from the content of the program, which was a good one on seed selection and irrigation. Following the farm forum there was a good discussion by twenty or thirty people.

All-India Radio has a plan through 1981 to develop, first, six stations in the major cities and then to increase these to fifty-six which would cover nineteen percent of the country and twenty-five percent of the population. If they project this growth to the year 2000 and have then from 150-175 stations, they would still be reaching only about eighty percent of the villages and the rural people.

What satellites offer in that situation is a quantum leap to buy time. India just can't wait this long, with her problems of population growth, agricultural production needs, the literacy problem, upgrading education, teacher training, and all the rest of it.

SYSTEMS APPLICATIONS OF TECHNOLOGY IN EDUCATION*

Launor F. Carter

What do we mean by software? At meetings of the Computer and Science Engineering Board, we talk about software engineering, and we are worried about how to train people in software engineering. There is no general agreement yet as to how people should be trained in this area; but some of the things which I believe a software engineer ought to be able to do are the following:

First, he ought to be able to analyze the requirements of persons who will use the various information or telecommunications systems. He should know the best approach to setting up a dialogue for these people and should find out what the requirements are in such a way that everyone is willing to live with these requirements as the system is being produced and after it is in operation. This requirements analysis is one of the fundamental capabilities needed by a software engineer.

The next step is the planning of the kind of systems design developed from the requirements analysis. We've heard it said so often during this conference, "if the education community would tell us what the requirements are . . ." How can it tell us what the requirements are unless we enter into a dialogue and work out these requirements together? So, planning with educators is the second area in which a systems software engineer ought to be able to function. It is understood, of course, that the systems design has to meet the objectives and requirements that were planned for. That's an easy thing to say but an extremely difficult thing to do because it involves budgets, it involves the technical equipment or hardware, it involves the procedures, it involves a whole myriad of things that have to be taken into consideration to develop an effective system.

Then, once the general system design is planned, the general layout of the hardware, the problem turns to the computer programing system; that is, the executive system that supervises the total

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*Launor F. Carter, vice-president, System Development Corporation addressed the Final Commission Meetings.

information processing system, the various utility systems that allow the building of object programs, and, of course, the object programs themselves. And so, a good software person needs to have this knowledge.

But perhaps as important, and perhaps in the area I have been talking about even more important, is the problem of procedures, of methods. You can have the best operating equipment in the world, but if people don't understand the procedures required to make it effective for the purpose for which it was designed, it is not going to be useful. The hardest thing we have to do is to design procedures and then to get the client to follow these procedures.

So, that brings us back to the problem of training. In our company, about one-fifth of all our budget is spent on training people how to use the various systems that we have helped develop. Installation involves much more than just putting in the equipment. The installation involves getting the procedures to work; training the people how to use the system; interacting often with the customer and the people he is trying to serve to see whether our system is working well; maintaining the system, not in the hardware sense, but in the sense of updating programs, procedures, and training, and, of course, maintaining and servicing the equipment.

And finally, there is the redefinition of the requirements and the iterative process of going through the same steps again. Our company's experience has been that we seldom get a system good enough to satisfy the new requirements which the client asks upon reexamination of the original design.

So, in the area of software, I term the sequential components of the engineering function as follows: requirements analysis, the system design, computer programing, development of procedures, development of training techniques, the installation problems, the maintenance problems, and the iteration of the whole process.

Now, I don't know whether or not all of that is understood in the term, "software," but I think if we are going to devise systems that are going to work in the educational community, we are going to have to think in terms of all those different activities, and not in just producing instructional sequences, or in just producing a computer program, or in just producing a satellite, but rather we are going to have to take the total systems approach.

With that introduction, I now wish to talk about some different applications of systems. I think, perhaps, the best way to get the feel of this is to look at a few specific examples. I am going to talk about things that my organization has been involved in since these are developments I am most knowledgeable about, yet let me emphasize that there are many other places and many other excellent organizations that are doing the same kinds of things.

The first one I want to mention is in the planning and requirements area. The state of Illinois, I think very wisely, decided that they needed to examine their total telecommunications problem. The legislature set up a commission to undertake this study, which is to plan the telecommunications requirements for the entire state as they are related to state finance programs for the next five years. We have been fortunate in being involved in this development.

Now, I think that it is terribly important that all states try to foresee what their requirements will be. You know, we have heard here that "if the educational community could only tell us what its plans were"--well, it is only going to tell us what its plans are in terms of total involvement of the regional or state situation, but this is going to require the states to plan cooperatively with the educational institutions as to what the telecommunications requirements are. Thus Illinois is taking a very great forward step in this direction. The study is not complete yet, but I have read the parts of the report which are available and this material is the major portion. One of the surprising things that comes out of a study of this nature is the fact that education is one of the very largest users of telecommunications in a state. The state of Illinois currently is spending over $9 million a year in state funds for telecommunications. Of this, almost $5 million is being spent in the education field. By 1975 predictions are that this spending will be approximately $16.5 million, of which $9.5 million will be in the education field. When the spending gets into those large figures, and then they are multiplied by the states, it is going to take some very careful planning of how and for what to expend this amount of money. The question might arise, "What state-supported subscribers are the largest users of the regular telephone service in Illinois?" Well, it turns out that the University of Illinois uses 30 percent, in cost, of all the telephones in the state that are financed by state funds; the next largest user is the Department of Mental Health; and the third largest is Southern Illinois University. The universities all appear at the top of the list; not until much further down the list are the police, the firemen, highway patrol and such services ranked. My point is that education is the big user in Illinois, and I think this holds true in most states.

Now, another interesting fact is the diversity of the kinds of uses of telecommunications. Telephones, we take for granted, but let's look at broadcast TV. There are two state-supported television systems in Illinois. (The city of Chicago has a private station which the city schools use extensively, but it is not state-funded.) Another capability which is supported to a large extent by public funds is the twenty-five separate CCTV and ITFS systems in higher education in the state of Illinois. It is obvious that the spectrum is getting crowded; there is a great deal of use, and it seems to me that there will have to be a fair amount of coordination, of planning at the state level for these sorts of frequency usage. It is probably going to take some organizational changes in Illinois to take care of the requirements for telecommunications, and I suspect that this will have to be done at the state level. The educators are going to have to protect their interests by becoming involved at the state level.

So, I refer to this study to emphasize that planning of this nature is extremely important at the state level in that it involves budgets, frequency requirements, questions of centralization and decentralization, and provisions for organizational frameworks and changes.

Many states are concerned and all are faced with these sorts of problems. South Carolina has a very extensive TV activity, as does North Carolina and other states. The systems software approach, it seems to me, is especially important in trying to understand how the state-wide systems can best serve the educational needs of the people of the entire state, both now and in the future.

CHARGE TO THE CONFERENCE COMMISSIONS*

John W. Meaney

The fabric of this conference has been designed to have a very definite warp and woof. The warp you have already begun to receive in the statement by C. Ray Carpenter of the conference theme and task and the intellectually challenging keynote address by Charles Frankel. You will be having other additions to the warp as we go along, some of them in televised presentations, some in luncheon and dinner addresses, some in the general session. In order to weave a coherent woof of reaction through all of these presentations, we have organized five working commissions. Each commission has a specific focus of interest, and it is expected during its working sessions to synthesize the implications for its area from the presentations.

Each commission has a designated "animateur" whose role is to liven up the sessions, as necessary, offering whatever challenging remarks may be needed to get the discussion started and to provoke constructive thinking. Each commission has a "summarizer" who will report at the final general session of the conference on his commission's achievements.

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*John W. Meaney, professor of communications arts and assistant to the vice-president for academic affairs for educational media, University of Notre Dame; and chairman, Conference Planning Committee, addressed the First General Assembly.

COMMISSION I: **Telecommunications and the University and Interinstitutional Cooperation**

Moderator: G. Kerry Smith, American Association for Higher Education

Animateur: John Witherspoon, San Diego State College

Summarizer: Andrew W. Molnar, U. S. Office of Education

Robert C. Anderson, University of Georgia

Jesse Arnelle, /I/D/E/A/

Christian Arnold, National Association of State Universities and Land-Grant Colleges

Jordan Baruch, EDUCOM

James Carmon, University of Georgia

Charles Frankel, Columbia University

Lee Franks, Wisconsin Coordinating Council for Higher Education

Winfred L. Godwin, Southern Regional Educational Board

John L. Green, Jr., University of Georgia

Hugh A. Greene, Indiana Higher Education Telecommunications Commission

Erling Jorgensen, Michigan State University

Daniel Karasik, COMSAT

John Kennedy, Georgia Institute of Technology

Theodore Koschler, Miami-Dade Junior College

Ralph Lee, Morehouse College

Claire List, The Ford Foundation

W. Worth MacDougald, University of Georgia

George Parthemos, University of Georgia

John R. Pierce, Bell Telephone Laboratories

Harold Roeth, State University of New York

Norman E. Watson, Orange Coast Junior College District

John Young, University of North Carolina

COMMISSION I

Telecommunications and the University and Interinstitutional Cooperation

OPENING STATEMENT

John Witherspoon

We are all acquainted with universities, and many of us are intimately acquainted with the idea of interuniversity cooperation. In the Midwest there is the Institute on Interuniversity Cooperation; in the South there is the Southern Regional Education Board; in the West there is the Western Interstate Commission on Higher Education, representing a kind of interinstitutional cooperation.

On a technological level, there have been some interesting developments. The Interuniversity Communications Council--EDUCOM--has done substantial work in network planning and in general technological study with regard to university problems; and two years ago the National Association of Educational Broadcasters sponsored an educational communications systems project with which I was identified. The project attempted to set up three model systems encompassing various kinds of university cooperation: one involving the Oregon State System of Higher Education; one involving the "Big Ten" universities and the University of Chicago in the Midwest; and one involving nonteaching institutions which are associated with universities in the East, such as the Smithsonian.

Out of these developments has come the Networks for Knowledge Act which focuses on some of the issues. However, rather than dwell upon these structural kinds of events, I prefer to discuss briefly three elements of the questions which are before us: we have the university per se; we have wider telecommunications systems; and we have our present and immediate future context. These three elements together are a kind of a matrix within which we have to work. There are certain characteristics of each of these--the university, the telecommunications systems, and the context--which ought to be kept in view.

The university fills several roles: it acts as a repository of information to be used; it is the discoverer and developer of new information; it is a teacher of undergraduates and of many graduate specialties and specialists; it acts as a teacher and as a mentor of all the professions; and nowadays it is a dominant force in the evolution of public education. In many institutions, the university is a center for lifetime learning, both formal and informal, for interested citizens. And this is a whole new dimension for which telecommunications has important bearing. Increasingly, the university acts as a leader in the formation of public policy, and we might pay some attention to the ways in which telecommunications influence or facilitate or create problems for that particular function. And finally, the university acts as part of the world community of centers of learning.

Now, another part of the matrix is modern telecommunications systems as means or potential means to do several things. One is to provide access to information in highly flexible ways. How does that bear on the university in the ways I have described them? These telecommunications systems act as a means or potential means to disseminate information and ideas rapidly and in forms which can be prescribed to fit the message and the intended receiver of the message. The systems act as means or potential means for spanning time and space. As we develop satellites, for instance, the distances between places are no longer really of valid concern. There are ways to provide means by which the individual may work effectively and personally with a body of knowledge, not an individual as one of a mass of mental sponges, but as an individual person, wrestling personally with information and ideas. These are some of the components of telecommunications systems.

The university and the systems exist in a context which also must be taken into account. The first part of this context that I'd like to emphasize is that the university is undergoing great changes in its relationships with its undergraduates as part of the shift in the way the young people reexamine modern society and their roles in it——and conversely, the way society as a whole views its younger members. We are all aware of the great changes taking place in this area.

Secondly, there are increasingly serious moral questions about the uses made of the results of scientific research, and the university finds itself in the middle of this discussion in several different ways.

Third, the world is turning more and more to the university for help in solving questions crucial to the survival of man--questions ranging from environmental pollution to birth control and to methods of relieving tensions among nations. And certainly, communications enter into the consideration of all of these problems.

Fourth, there are heavier demands on public school education coupled with increasing attention to cost effectiveness ratios in education as well as in other areas. We are now in an era when there is a serious effort to reform curriculum and instructional methods in schools, although human nature is still with us, and we still cherish familiar ways of doing things.

The fifth part of our context is that people need not be bound to work from late childhood through old age in order to provide themselves with food and shelter. We face the prospect for much richer lives, but we are unsure of what constitutes a full, rich life. And the university, of course, is much involved in all of these things.

And finally, and at the same time as part of our context, the gap between rich nations and poor nations is widening, not narrowing, and this situation creates conditions which are unfair in human terms and, let us say, explosive in political terms.

And so we have the University, the Technology and the Context. There are great technological problems; there are enormous social and political problems; and there is an occasional tendency to confuse means and ends. But today we have a direct challenge; given the University, the Technology and the Context: How should we, as a profession and as a nation, bring about the greatest benefits?

COMMISSION I

Telecommunications and the University and Interinstitutional Cooperation

GENERAL DISCUSSION

Andrew W. Molnar: It seems to me that in educational telecommunications today we have a big information gap. Manufacturers don't know what to produce because they can't find consumers who can tell the manufacturers what their needs are. Educators don't know what the manufacturers can do, and today no one is filling this communication gap. Nobody, according to the gentleman from Morehouse College, can say what he can do for 3,000–4,000 students. I think this is a serious gap in educational technology and somebody ought to be filling this role. This is the first thing.

Secondly, within government, it is pretty apparent that equal opportunity of education is here––I mean in actual volume, but what does this mean for higher education? It means that instead of about three percent of the population, we are going to be serving anywhere from forty to fifty percent of the population. If we continue to educate in the tradition that we now have, we will flunk ninety-five percent of those students. That is not possible. The students are going to be different. We are not going to say, "Here comes a student; we are going to give him information. He gets what he can out of it and that's that." I think now it is pretty apparent that where the students passed or failed before, the school systems, the educational systems of the future are going to keep students until they pass. So the question is this: If we are going to get that large influx of students which is completely different from the students which we are educating now, how are we going to provide all these services? Telecommunications is one way, but there are a lot of problems involved. More education is another thing. We are going to have two or three professions in a lifetime. We have talked about continuing education, but we haven't really done anything about it. The question is how do we provide education for everyone. The computer specialists might not want to go to college but may want computer information from a college source.

The third area which I think is critical is now sweeping elementary and secondary education, and I think is going to hit colleges: individualized instruction. I think it is pretty clear that there are many ways

of getting an education. For very few hours are students in the classroom--less than eight percent of the time of a student is spent in the classroom. So consequently, if the professor thinks he is influencing the student, he is deluding himself. The real influences come from colleagues, library resources, and many other kinds of stimulation. So I think the big question is how individualized instruction of a student can make the most of his time in moving from a mass education to an individual education.

Another area which is critical is the standard of education. In other words, in the past the individual had the responsibility of getting the best he could out of an education. This responsibility is now shifting to the institution. We have colleges in this country that are turning out a quality of education that is less than a high school education. We have elementary and secondary schools that can graduate students that are functionally illiterate.

A system can't be designed on an uncoordinated basis, but if we are going to take advantage of the thinking of many people, we are going to have to lose some of the individuality we now enjoy. And the question is this: What are the trade-offs here? Are they worth the cost? Do we really want to provide education? Another thing, it seems to me ridiculous that we have to go to a specific university because it has a library in Shakespearean works or East Asian studies. We know that we can duplicate a complete library for $300,000 and send it anywhere in the world. The question, in terms of technology, is why we are developing institutions rather than educational resources.

Daniel Karasik: My message is very brief, and it is this: Distance now has no meaning.

We now have two generations of sateilites operating commercially, so we have had three-and-a-half years of experience. The first satellite was called Early Bird, had a capacity of 240 two-way telephone circuits, and a life expectancy of a year and a half. We said that economically this gives us 360 circuit years of use. In other words, 240 x 1.5 years came out to 360 circuit years of use. This satellite was launched in 1965 and is still working fine in 1968; so a year and a half is only what the engineers projected and were willing to guarantee, as far as contract was concerned, of how long it would operate.

The second generation of satellites is INTELSAT IIs--there are two over the Pacific and one over the Atlantic. These also had 240 circuit years of capacity but the difference between these two satellites was primarily that INTELSTAT I was focused on the Northern Atlantic area, and it didn't take as much

power to receive signals from this type of satellite. The two latest models were launched in 1966 and 1967, so they are good for three years. Of course, they are still operating, but in this one generation which was only a year in coming, the capacity, the output, the economics of that satellite changed by one magnitude. In other words, the capacity doubled. In less than two weeks, we hope we are going to put up another satellite; it's already on the pad--INTELSAT III. We had a failure in the launch of one of these because of a very simple thing, someone may have forgotten to tighten a wire in a connection. Nothing complicated at all, but it caused the booster to fail and so we lost our satellite in the ocean, $11.5 million worth.

But this next one has 1200 circuits and it's expected to last five years. So this figure goes to 6,000 circuit years capacity.

The next generation of satellites has just been contracted for and we hope to keep the cost at $72 million. This is the international version of the satellite. It has 6,000 circuits and will last about seven years, which is 42,000 circuit years. The expected launch date is 1970 or 1971.

The reason I've given you these figures is to show that in a five-year period and in four equipment generations, we've had an increase of 120 times the effectiveness in the satellite. To put it another way, the cost of getting this bird into space about doubles, but its effectiveness increases about 120 times. There are instances in this industry where technology is going ahead so quickly that no one can predict what it's going to be ten years from now.

Now, what does this mean to you as educators? Well, each circuit in the Early Bird satellite, in order to get it into space, cost $15,300 a year. But each circuit in **this** satellite will cost $500 a year.

From the floor: Many people say that the golden age of education is over. There aren't going to be more funds. What can we do within the amount of money, within the resources that we have available to us now?

Daniel Karasik: COMSAT's proposal is that in the two Western time zones, two television bands with channels be made available without charge during an experimental or development period for educational broadcasts or educational purposes. Basically what this means is that we invite all interested parties to come forward and sit around a table and plan a system that would be a good test and that we

would fund the system to get it into operation, about six or seven million dollars. We would be willing to abide by the decision of the FCC as to their award of ownership or shares of ownership.

And in the meantime we would activate the operative system. A very important part of this decision is how we can keep pace with the existing ground network, and whether in some experimental cases we would be able to deal directly with the educators or directly with the broadcasters or whether we must always work through common carriers.

No one really knows, as a matter of fact, exactly how this system is going to work out, but we're all quite certain there is going to be such a system in a few years, and what we need is the planning experience, the operating experience, the experience on cost effectiveness and all the other factors.

Is there a serious problem here when we get into other than television or the latest kinds of general distribution or transmission? We acknowledge that the need for data on demand is certain to involve very high switching costs, and very complicated systems of sending from one individual point to get specific information back from another particular point.

As to cost effectiveness, this is established according to the point of distance it is preferable to have satellite transmission to, say, establishing a microwave. It is based on the amount of traffic in the area. Now, if you're talking about transmission between Georgia and Boston, you might find that additional channels are needed even though it's a short distance, and some day it will be cheaper to go by satellite. Most of the charges I have seen show that satellites for distances of 400 miles and upward could be the less expensive carriers.

As is evident all around us, every college professor, for example, is wanting to buy a computer. The question is, could those costs be aggregated in some way? I think the problem of cost effectiveness is a serious one, but we can't justify all of the experiments that have been done to demonstrate cost effectiveness to education. I think this is the wrong question to ask. I don't think we should justify education on the basis of cost effectiveness.

Andrew W. Molnar: There is a proposal to develop a biomedical information network. Its proponents think that if they handle all the Medicare records in this biomedical network program that there

will be sufficient funds to permit doctors to communicate back and forth at will with each other and to interrogate a central bank of information. These will be added services at the level which we're currently spending to maintain records manually. I really think if education is to justify an educational system, it ought to be considering an integrated regional system--fire, police, civil defense. For example, something in the neighborhood of billions of dollars are spent on civil defense by having little units around the country. If we were to do civil defense by a regional system, we would probably justify the cost for many educators to communicate wherever they may want--in other words, to reduce those costs by using this particular system.

Another aspect concerns our urban problems. In the past, cities have followed rivers and transportation. I believe in this age industry follows universities. When a university such as Irvine is established, we find industry moving to it. One way to solve the urban problem is to draw a belt across the central part of the United States, develop a series of universities, and then wait for industry to follow them. In other words, we can now extend the urban sprawl even further. If we took all the money that we're going to put this year into libraries and set up a central depository, we could use that money to have a superior library system without building new buildings.

Or, for example, if we're going to support student loans, is it possible that educational technology could reduce the cost of education so that we would not have to raise tuition and pay for it from student loans?

Then there is the question of equal opportunity--if we want to spread education to every segment of our society, because in a highly technological society it is expensive to have people on welfare, on unemployment compensation, it may appreciably reduce the costs of welfare by providing education for the people so that they can be gainfully employed. What I'm suggesting is this, since we are spending $3.9 billion on education, perhaps it is possible to reprogram some of those costs in a different way. For example, some people suggested that the negative income tax could substitute for welfare programs, or that if we paid everybody who had an accident, just paid them off without taking it to the courts and to the insurance firms, we could cover all accidents. These are different ways of looking at the problem, at a different conceptual level, in terms of cost and payoffs.

The only way to justify cost effectiveness for education is to take a regional look and to include other things in addition to education. In this way we can distribute the benefits arrived at in terms of cost savings by going a regional route rather than by trying to justify the cost effectiveness of each segment of instructional material.

I've written a paper called "Educational Media, Big White Elephant," and my point is that we've done $46 million worth of research on educational technology yet we have no developmental projects which have evolved from that research. Unless we're serious about moving ahead and do something about it, we should stop doing research on education technology.

But I really think that unless we can identify a critical national need for education, unless we can muster resources to meet that national need, we will be saying five or ten years from now the same thing we are now saying. There are enough problems in our current society and in our education systems that I think we can get at least a minimum consensus. The question is not whether it will work, whether it is cost effective, whether it is economical, whether it is reasonable; the question is rather what needs to be done now and in the future. I see no choice because of the way education is structured.

Mr. Pierce made an excellent report on computers. It is clear that computer science is a basic industry in this country and as important as the steel industry. Every movement of our life involves a computer. Is this something that should be in our educational process? Certainly it should be in our educational process. Will it be? I doubt it, not for a long time to come. The question is, how do we move, what are we going to do?

From the floor: It really is the old question of how will higher education innovate, or how will it be receptive to innovation?

Andrew W. Molnar: Innovation is one of the most difficult problems anywhere in the world. Innovation comes about when there is a crisis; everything has been tried and has failed. Or when we have nothing at all and anything is an improvement. I think that every time we evaluate technology, we have evaluated it against the top one hundred affluent colleges or the suburban school. There is a large proportion of our nation which is getting no education or a poor specimen of education. But we have to ask

ourselves, if, at a first-class university, students can get a good education at present, not to challenge that, not to worry about a small amount of improvement. Let's go to those schools who really need help in their education program and are not getting it and try to give them a large increment of improvement through technological means. I think the junior colleges, the ones that have no tradition, are wanting to adopt that knowledge and are willing to jump right in and use educational technology.

COMMISSION I

Telecommunications and The University and Interinstitutional Cooperation

REPORT AND RECOMMENDATIONS

Research and development is generating more and more excellent ideas on the future and potential of educational technology. While continuing to explore the future, we should concentrate on the development of systems which are currently within the state of the art.

It should be recognized that the development of complex telecommunication systems must be a team effort which involves the administration of systems, development and production of materials, and the consecutive testing of their effectiveness. Included in this should be studies of the impact on the attitudes of students, faculty members, and administrators.

We must keep in mind that the objective of educational technology is to facilitate learning processes. An essential aspect of telecommunications systems which is currently being neglected is the development of instructional materials and operational or use strategies. Therefore, we make the following recommendations:

1. Investments must be made to develop programs which are more nearly comparable to the resources that are provided for equipment systems.

2. Institutions of higher education, private foundations, and the federal government should undertake large-scale developmental projects designed to reduce the costs and improve the quality of higher education.

3. Funding should be provided to create, and give continuing support to, cooperative research and development centers and regional laboratories for the development of useful instructional systems and tested materials. Such centers and laboratories should permit individuals, institutions, institutions of higher education, and existing professional organizations to work together in the improvement of instruction through telecommunications.

4. JCET should work through national organizations of higher education to develop demonstration projects which utilize telecommunications media for international education and mutual understanding.

5. JCET should stimulate experiments and demonstrations for the sharing of intellectual resources of higher education by involving scholars in senior colleges and universities, junior colleges, and secondary schools and encouraging them to work cooperatively through their disciplines and professional associations.

6. JCET should identify and assist innovative educational leaders and institutions who are active in the improvement of instruction through telecommunications systems.

7. JCET should immediately institute a study of electronic spectrum requirements for education and make a formal request for space on satellite, CATV, and radio systems. Subsequent to this, an operational plan for the educational utilization of this space should be developed. (Urgent)

8. JCET should establish a task force for the purpose of formulating a consistent overall philosophical approach and for designing a strategy to use communications media to attack major social problems.

9. JCET should institute feasibility studies to determine what role telecommunications can play in providing ——

a. Equal opportunity for postsecondary education,

b. Individualized instruction for students of all abilities.

10. JCET should seek to help educational institutions and individuals who wish to adopt telecommunications systems by referring them to appropriate business, industry, and government sources that can assist them in providing information, advice, and financial help to meet their needs.

11. It is recommended that the Office of Education, through the Educational Professional Development Act, initiate and enlarge existing programs for the development of training for interns, faculty, and administrators in the use of telecommunications.

12. JCET should develop a comprehensive information and dissemination program on the potentialities of telecommunications for all levels of education.

13. JCET should recommend to the Congress that the Networks for Knowledge, Title VIII of the Higher Education Act of 1968, be fully funded and that the Office of Education be encouraged to develop a comprehensive planning study.

INDIVIDUAL RECOMMENDATION

JCET should establish a task force for the following purposes:

A. Stating general educational theories implicit in current instructional strategies. (For example, what theory is implied by the prevalence of the lecture method in higher education?)

B. Modifying the theories thus stated so that they have maximum value in developing strategies which would achieve desirable results for students.

C. Evolving a set of instructional strategies, including but not limited to use of telecommunications, deriving from and consistent with the general learning theory.

D. Creating specific proposals including recommendations for funding for implementing these instructional strategies through the use of telecommunications and addressing major social problems.

Hugh Greene
Member, Commission I

COMMISSION II: **Telecommunications and the School and Preschool Education**

Moderator: Curtis P. Ramsey, George Peabody College for Teachers

Animateur: Walter Stone, University of Pittsburgh

Summarizer: Carroll V. Newsom, Radio Corporation of America

Richard H. Bell, Ampex Corporation

Launor Carter, System Development Corporation

Ward Chamberlin, Corporation for Public Broadcasting

W. Henry Cone, Educational Commission of the States

Martha Gable, American Association of School Administrators

William Kessler, Consulting Engineer

Robert Maull, National Association of Educational Broadcasters

James McDonnell, Aerospace Educational Foundation

Rev. John F. Meyers, National Catholic Educational Association

H. Walstein Parker, Sylvania, Georgia

Donald Sandburg, The Ford Foundation

Samuel G. Sava, /I/D/E/A/

Sidney Tickton, Academy for Educational Development

Gordon Tubbs, Eastman Kodak Company

John Zebrauskas, Chicago Public Schools

Howard Bosley, Multi-State Teacher Educational Project

Edmund Pease, Foundation for Advanced Communications for Education

William Stump, American Telephone and Telegraph Company

Harriett Lundgaard, Educational Media Council

COMMISSION II

Telecommunications and the School and Preschool Education

OPENING STATEMENT

Walter Stone

We talk in one-dimensional terms. We talk first about selling the idea, then about change, then research, then something else. We talk in different time dimensions. I think what we need to be thinking about is essentially a kind of philosophy of educational communications support services which are required by American education.

Then within the framework of that philosophy there is a spectrum of responsibility which requires that we constantly study as a research enterprise what difference the introduction of the various types of instructional resources makes or does not make. We need to do that kind of research, on how our services are working, plus institutional research.

Along with the research activity, we also need to have an activity which can make available information about the resources that we already have. I submit that in the average school system the process a teacher has to use to select and order a film for classroom use is unnecessarily complicated and administratively difficult to manage. In fact, the paper work gets in the way of the effective use of the existing instructional materials. We don't have a coordinated system of providing information about our learning resources. We need a better distributive mechanism for information about materials as well as for the materials themselves.

In addition we need a production capability. We have to have a Tennessee Valley Authority operation in education which charts new courses and experiments and provides innovative materials in small amounts to demonstrate the way they can be used. We have to set up the mechanism which will do this effectively and on a proper scale.

We obviously have to have the necessary counseling and training activities available to teachers in their individual schools as well as to those preparing to become teachers within the educational institutions. We must introduce the consumer to the materials available and show him how to use them before he can assess their worth. This requirement, then, would necessitate that demonstration centers to serve these display functions be established throughout the nation.

I personally believe that the computer is both an interactive device which individuals can use and a means for reaching out and extending educational opportunity to large numbers. It is a most important potential resource both for controlling the distribution of educational resources as well as for providing direct assistance to educational institutions.

With this wide spectrum of concern, I submit, furthermore, that important developments are occurring at the state level. Money is being obtained now. Universities in one state are linked together by a computer for sharing of resources. Public libraries in another are interconnected by teletype for sharing of resources. In another state, university, public, and school libraries are connected for provision of information about their resources. Of course, we have jurisdictional disputes among specialists. What we have to identify is this spectrum of requirements and responsibility consistent with the needs of an educational communications support system.

I think that it is a state-level responsibility, and I'm not sure that the projected regional educational laboratories can do much more than help us to study the problems of a larger-than-state area or region at this time. Therefore, I urge, personally, that we look particularly at our own states in the present situation. The agencies are there. Bring them together for discussion of how we create the kind of implementation apparatus which will use existing resources to carry out this full range of communications responsibilities for education.

COMMISSION II

Telecommunications and the School and Preschool Education

GENERAL DISCUSSION

Edmund Pease: Telecommunications for education will become economically impractical if either of two things occurs: first, if education fails to have reserved for itself the independent operation of both satellites and ground terminals, just as it has the present operation of ITFS systems; or, secondly, if computer access to libraries is denied by copyright legislation.

William Stump: I attend many educational meetings, and I observe that at 99 percent of them the educators want to set up education-industry dialogue, involving only that part of industry which is a supplier to education. They completely forget about the fact that the other 99 percent of industry in this country is just as vitally concerned with the problems of education as are those who are the suppliers. I would like to see at meetings like this representatives of such corporations as U. S. Steel, Proctor and Gamble, and the paper companies. If you think these corporate giants are not interested in education, you are extremely mistaken. They contribute millions to higher education today through their corporate aid programs. They are all seriously questioning if this is a wise thing to do, if they could get more value for the dollars invested from different kinds of programs.

AT&T has an employee program which promises a college graduate, if he will come to work and stay five years, that it will contribute to his alma mater a given sum of money in his name. Other companies have similar programs. JCET could get tremendous support from such companies if it approaches them in the right way.

Edmund Pease: The issue is this: must education request the decision makers to preserve the option for educational communication to have independent satellite and ground communication systems until the commercial utilities can demonstrate that they can provide these at costs which education can afford?

We had to make decisions on the Polaris submarines before we even knew that it was possible for a solid state launched vehicle to be built. We're in the situation now where, if education waits until it can define precisely its requirements, it will be 1990 and by then there won't be anything to decide. Hence, what education must do is to estimate the minimum requirements. The commercial interests will obviously react violently that they should lose all of that band width, but they must accept the situation. The public interest should come first in the allocation of broadcasting spectrum.

William Kessler: I think education would be better off making an estimate as to what its spectrum needs might be and then try to get them.

Edmund Pease: Mexico is planning an ITV installation costing $26 million. I suggest that education in America which paid the $28 billion to develop space research and satellites certainly can ask to have reserved for it as much as Mexico has been authorized by our State Department to negotiate for from the United States. Any satellite which Mexico or Canada can use will also be received in the United States. Maybe education should negotiate with Mexico or Canada for use of a satellite! But surely the American public should not be deprived of as much as Mexico is going to be able to get from us.

Martha Gable: There are a great many experiments around the country showing various applications of different kinds of educational technology. Sometimes the results are very encouraging, but then, when an attempt is made to expand these to reach more children and to mesh them with programs and different components, there is an incompatibility factor because of lack of standardization among some of the equipment. You can use some of the material on one kind of computer but not on another; you can use some one-inch videotape on this machine but not on another. This might seem just a peripheral point, but it has blocked us in Philadelphia and has caused a great deal of frustration to decision makers because they have a proliferation of experiments even within one school system, but when they try to put them all together, it turns out to be impossible.

Sidney Tickton: In looking at problems we ought to take the toughest ones, the problems of the underprivileged, to put our technology to work on. You have to have visible demonstrations because the incredibility gap is terrific. You have to have money, also, to take people to see the demonstrations.

Edmund Pease: Modern education involves three broad functions——storage and retrieval, telecommunications, and the display-response sensing. Cost is critical.

Massachusetts Institute of Technology Research and Engineering (MITRE), University of Illinois, and the Foundation for Advanced Communication for Education have reported detailed studies of the state of the art in the design of a system encompassing all three of these functions.

The common objective was to provide interactive, real time, individually paced instruction for less than the current teacher/student/hour cost of thirty to sixty cents in response to the demand for "individualized instruction" recently hailed by U. S. Office of Education Commissioner Lessinger as critical to the urban education problem.

The above-cited organizations announced immediately feasible systems at costs of fourteen, twenty-five, and ten cents per hour, respectively, with the critical cost element using the mode of telecommunications.

Irrespective of the general beliefs with regard to these values, it is a fact that satellites with ITFS microwave are the only methods foreseen by informed scientists that will minimize the telecommunications elements that are essential for the achievement of cost levels below thirty cents/terminal/hour, stated by U. S. Office of Education Associate Commissioner of Education Bright to be the upper limit for instructional equipment systems.

Reports by Hughes, General Electric, Philco-Ford, and the considered opinion of scientists retained by the President's Task Force on Communications Policy are that sums approximately equivalent to $1.00 per year per U. S. student will orbit a multipurpose TV and educational communication satellite, including ground stations at all ITFS sites necessary to reach our fifty largest metropolitan areas.

For each ten cents per student-hour that can be saved from the thirty-six-cent minimum, education can use for other needs funds which approximate $5 billion annually. This is the justification for the expenditure of some part of $50 billion on systems cost over a ten-year amortization period.

It is implicit in the function of an information-transfer system, such as education, as well as in electronic library/computer/interconnection/display complexes, that the more rapidly each transaction can be handled as determined by the telecommunication system the lower the cost.

The current copyright legislation, the argument before the FCC, and certain commercial interests threaten to deny public education freedom from untenable royalties and utility charges even though most of the costs of both research and space equipment development have been purchased by the public, and these freedoms are a rightful dividend from the public risk investment.

Therefore, planning should first attack the problem of convincing the decision makers that education must retain its option to operate its own satellite and ground distribution facilities and be free of untenable copyright regulation, as well as convince leaders in educational management they must acquire their own objective noncommercial advisers as to the telecommunication systems design. At stake is a large part of the above-cited $50 billion.

COMMISSION II

Telecommunications and the School and Preschool Education

REPORT AND RECOMMENDATIONS

1. Fear was expressed that imminent federal action may permanently foreclose the reservation of satellite channels for education; therefore, the commission urgently recommends immediate action by JCET, with other appropriate groups, to obtain funds to attempt an assessment (as specifically as possible at the present time) of the educational needs of satellite services and then petition appropriate authorities to preserve the rights of education for such services.

2. Concern was expressed that present discussions of the copyright law may lead to revisions that will give insufficient attention to the needs of education. It is recommended, therefore, that JCET intensify efforts on all strategic fronts to safeguard the needs of education.

3. It is recommended that JCET provide appropriate information to the President of the United States and to a selected number of his advisers in the hope that proper recognition will be given by the federal administration to the potentials of telecommunications systems for improving educational opportunity for all ages throughout the country by distributing well-conceived programs to homes and schools and by providing unique services designed to meet special and urgent needs in urban communities, e.g., combatting illiteracy, improving basic skills, etc.

4. It is recommended that JCET create a special task force of six members, three from JCET and three from teacher-training agencies of the country, to design procedures and programs for teachers, preservice and in-service, so that teachers in the nation will be assisted to understand the values to them and to their students of employing properly designed and properly chosen technology in their instructional endeavors.

5. It is recommended that JCET, in alliance with other groups, possibly through the use of task forces, design and propose to the present administration a legislative program in the form of a National

Educational Telecommunications Bill or as a modification of existing or proposed legislation, that would make possible —

a. the mobilization of telecommunications resources designed to resolve acute educational problems, e.g., reading in the inner city, etc.;

b. the establishment of an educational telecommunications **access commission** in each state, or in each region, which would encourage the creation of new and improved administrative arrangements to locate, describe, store, retrieve, and distribute efficiently all forms of educational telecommunications services and technology and would determine priorities, sponsor studies to assess worth and requirements, and recommend actions at state and regional levels;

c. the establishment of a quasi-public corporation which would assist in expediting the uses of educational telecommunications resources of all types and would provide responses to the need for desirable changes in the educational system.

COMMISSION III: Telecommunications and Continuing, Professional, and Adult Education

Moderator: John W. Meaney, University of Notre Dame

Animateur: Robert B. Hudson, National Educational Television

Summarizer: Walter J. Mars, American Association of Colleges for Teacher Education

John Beery, University of Miami

William Bowden, University System of Georgia

Cyril Braum, Consulting Engineer

Richard Cortright, National Association for Public School Adult Education

Lark O. Daniel, Southern Educational Communications Association

William R. Dodge, State University of New York

J. W. Fanning, University of Georgia

Lewis Fibel, American Association of Junior Colleges

C. Scott Fletcher, National Association of Educational Broadcasters

Albert Fredette, Albany Medical College

Lawrence Frymire, Illinois State Commission Authority

William Hale, University of Georgia

Henry J. Hermanowicz, Illinois State University

Catherine Kirkland, Georgia State Department of Education

Thomas Mahler, University of Georgia

James Robertson, National Association of Educational Broadcasters, and University of Wisconsin

Ralph Steetle, Oregon State System of Higher Education

Curtis Ulmer, University of Georgia

COMMISSION III

Telecommunications and Continuing, Professional, and Adult Education

OPENING STATEMENT

Robert B. Hudson

I shall discuss briefly an area of real concern to all of us relating to continuing and adult education. Over the historic years of educational television and to some degree over the years of broadcasting, it has always been a great disappointment to me that adult education has never found very effective ways to use the medium of radio or broadcasting. I think you can state this in absolute terms. In relative terms you have had over the past twelve years a substantial development of what we presently call instructional television which is primarily supported by the government and foundations, by school systems, and by state authorities. The whole development of the ETV movement has been coordinated with a development in the instructional uses of television--that is, its use in classrooms and, if you look at the statistics, mainly in the elementary schools. I suppose you could include the preschool level, too, to some degree secondary school, and to a far less degree, the university level.

But we have not had very much use in institutionalized continuing adult education. On the other side, we have the significant development in what is presently called public television. That is, general audience broadcasting, primarily in the prime-time periods.

But this is material that is not nearly as carefully or as systematically structured as we would like to have for adult and continuing education. So I have a feeling that adult education, continuing education, is caught in the dilemma of the medium being more and more effectively used as an instructional device for early elementary education, and as programing in the broad spectrum of public affairs and culture. But we haven't used this medium adequately, although it has many significant advantages, in the field of adult education.

One of the real problems in the field of adult education is to get people motivated and aroused to attend classes or discussion groups or react overtly. We all know, of course, that there is only a very small percentage of people actively participating in organized adult education, continuing education programs, something less than ten percent of the people who have access to television and radio. So the questions I pose are "Why have we not been successful? Why do we not attract the potential number of adult students? What kind of motivation is lacking? What kind of program systems must people have to insure a needed development?"

COMMISSION III

Telecommunications and Continuing, Professional, and Adult Education

GENERAL DISCUSSION

Ralph Steetle: I would like to expand on a phrase that Bob Hudson used: As we identify institutionally structured adult or continuing education where there is an area of great blindness on the part of broadcasters and on the part of continuing educators, we find something in continuing education or extension that fits into a pre-existing set of patterns. These patterns are well known to us. I think I could defend this point successfully: that public television, NET, is a basic, continuing, educational force; and that for example, when the people who measure a week of educational television say that adult education went down two-tenths of a percent and general public television went up three-tenths of a percent, I reply that the more people who have access to these programs on our educational channels, the more truly do they have a continuing educational opportunity. Broadcasting is not in the terms of structure as we know it, and one of our dilemmas is that what we predict comes true. In other words there was the period when we talked about the rising tide of enrollments, and then it happened. And we have all the problems that grew out of this generation of people. Then we talked about a new universal requirement, which is that everyone has to continually update his education. This also has happened. But if we try to use the traditional methods of continuing education access, all of the instructors at all of the levels, at all of the schools, at all of the colleges could not conceivably meet the needs of today's complex society.

We have to begin to recognize, it seems to me, some of the instrumentalities that are already in use. We have to recognize some identical purposes but different techniques, and this is an area where we have had no conversation on basic issues. NET, for example, may be one of the major continuing educational forces in the country. But it doesn't so assess its efforts nor is it so assessed by the professional educator.

C. Scott Fletcher: The potential is very great to provide adult education by a medium such as radio or television, but there are problems. First of all, there are very few administrators of adult education

who have access to the amount of funds that are necessary to produce the type of programs that are effective. And they haven't had experience in the same way as have hundreds and thousands of teachers in schools and colleges who have had access to the use of television or radio.

Let's look at some of the things that are happening, however, on the brighter side of the picture.

One, in the field of medicine a great deal is going on. The medical profession is relying on both television and radio for learning all kinds of new techniques through the utilization of technologies, and this could not be accomplished any other way. How could doctors find time to read all that they need to read? When they can get up at six o'clock in the morning and find various TV programs scrambled and unscrambled for them, they appreciate that this is a tremendous service to them. They have said publicly that they can't afford to be without this kind of in-service education.

Let's take a few other programs that have developed recently, programs for the underprivileged. This area was the subject for discussion at a recent convention and we broadcasters were chided by some extremely intelligent black people, writers, professors, psychologists. Here again we've probably been going to the wrong people, and thus approaching this very difficult problem in the wrong way. Once more lack of funds complicates the problem.

There have been grants made by the federal government, in some instances to NAACP, in other instances to state institutions, and some excellent programs have resulted. Now there are very few people in our federal agencies in Washington, or even in the regional offices, who have had any experience at all in the use of the media. It is true that agriculture uses media in its own particular way for its own particular purposes, but when it comes to other fields there are very few people who have had any experience in the use of media. An educational job has to be done if media are to be used to full advantage.

The problem of state-supported continuing education is that there have always been state funds for education in general rather than state funds for adult education in particular. Something always has to be the first to be cut off; so adult education is the first thing to go.

As for institutional audiences, school boards are terrified of being involved in certain kinds of adult education, particularly if the programs are at all controversial. When a school board meets, the items

on the agenda week after week will cover everything from milk to buses but very rarely will include television or radio. The same is true of universities, in particular the state-owned institutions. But when a community station has a board meeting, the only item on the agenda is educational radio and television. There is no other item. And this is why, in our public school systems, the attention of the board members is not riveted upon this problem. They don't know much about it. Therefore, nothing much can be done about it. I think this is another educational job that has to be done.

Larry Frymore: I agree substantially with you, Scotty. Part of our problem is that we haven't found out how to use the media to promote the media. But there is a larger question.

How much continuing professional and adult education do we need in this society? What are our hopes?

Although continuing education is only one segment of the field of public services in adult education, that in itself is enormous. One example of professional in-service training is hospital administration. The national headquarters in Chicago occupies a five- or six-story building, and a large staff of field workers covers the United States on a twelve-month basis. Another example is pharmacy. The pharmacists through their associations have recently passed requirements that every pharmacist in the United States must return to school every six or seven years in order to be recertified or else he loses his license. I'm just citing quickly two examples out of many with very large constituencies and with a tremendous range of needs to point out just how gigantic in scope professional education is.

You have, I think, a very good example in professional services because of the need there. In some respects they have been discovering new applications for the technology as new technology is being developed. It seems to me that in the field of adult education, even among the professional groups, the second question is that of motivation. With doctors, and with pharmacists, and with lawyers and hundreds of other groups, there is real motivation to update their education at a professional level. With this strong motivation professional people are really turning to the media and beginning to use them to very great advantage.

We could use these techniques developed by professional associations to attract dropouts back into the educational system, but we haven't found a key for motivation, have we?

This sounds relatively easy, but there are vast numbers of people in the country that we hope eventually to be able to reach.

Al Fredette: Speaking in terms of the needs of the medical profession and health sciences, whether the context is urban or rural, the underprivileged or the privileged, the continuation of the education of the allied health professions has a far-reaching effect on the American public.

As I see it, one of the myths in medical education is that the physician is motivated. I'm sorry to say he is not. And what media, what telecommunications in various forms presently around the country are **not** doing is motivating the man. Motivation may not be the correct term, but what it amounts to is that he has easy access to more material providing a greater threshold of information on which he can draw. He won't learn dramatic new techniques, we won't be doing anything in post-graduate medicine on heart transplants for at least ten years. But what we are doing is going over and over the importance of recognizing what a diet is, how important the diet is for a diabetic, for example, to keep the material at the action threshold level. And so what we're doing really is using media around the country to try and motivate the physician.

Let's move from a consideration of physician education to the allied health areas. There are over 300 allied health professional areas which don't require an advanced degree of professiona. training but are considered in the allied health sciences. They include everything from nursing and hospital administration to dietetics and some of the housekeeping functions. I've had broadcasters tell me that they discontinued educational television programs for physicians in their coverage area because the doctors never wrote in and told how much they enjoyed them. Now, if we took that attitude, we would have stopped post-graduate medical education a long time ago. There is a very small percentage of physicians in this country that are properly motivated, that are going to become more motivated by their professional organizations, and, if not by their professional organizations, they are going to become more motivated by their government.

What devices have proved most effective in preventing professional obsolescence? The cassette in the automobile or TV?

I agree completely with the statement Mr. Frankel made this morning that there is no substitute for personal education. And thus we will continue to spend money, time, and effort to attract physicians to

"in-person" teaching activities, either at institutions or at hospitals throughout the area. That's our primary effort.

However, facing the facts of life, or what we refer to as a legitimate attempt to do so, often doctors are not able to come to the information. They aren't all multimillionaires. They have a practice to be concerned with and they are susceptible to the loss of dollars. They are sensitive to the need to have another doctor on call for their patients for the time they are away for a program in post-graduate medicine. What we are doing along with many other colleges that are committed to post-graduate medical studies is trying to make the information as easily obtainable as possible through media; through radio, through television, through one-way and two-way radio, through devices like the audio-digest so that doctors can listen to information on cassettes in their cars.

At the present time, we have no feeling about which media are best. We will take advantage of the quickest and most effective means. We are providing large amounts of this material, in all of these forms, and we hope it will be used.

William R. Dodge: I'd like to comment on the magnitude of the job because most of us are not aware of the large numbers of people involved. If we just deal with those people who are motivated, we already have more than we can do. In New York last year we ran noncredit courses for 191,000 people, at the campus we have slightly over 100,000 people enrolled in part-time credit courses, and by the end of the year we'll probably have a similar number in our noncredit activities.

Our concern is to develop a delivery or distribution system for continuing education that makes it maximally convenient for the individual. Broadcast television doesn't meet this standard in many ways, and this is one of the reasons why we have a low performance record. We find that using telelectures, telewriters, videotapes mailed out to a location where a class could meet and coordinated with correspondence study lessons, a telephone conference through the telelecture system with the instructor, or any variety of media seems to please the student more than being at the TV set at 6:30 in the evening. And if a student continues to view the TV material, it is not because we are good at broadcasting, for instance, for the professions. We've done several series with physicians, and I'm not judging the quality, but they're on the air, they're shown at 6:30 in the evening, and we follow up the broadcasts with the same videotape

recordings used on closed-circuit systems on the campuses in the same areas where these tapes have already been broadcast. We finally received a good response from the local dental society and the medical society, both of which want their members to see the tapes and follow up the recordings with discussion and other activities.

So, I think first of all if educational television is going to be used to the extent that we would like to see it used as a distribution system for instruction and education, then we've got to break out of a rigid format where everybody has to be at the same place at the same time. Most people just cannot do this.

And secondly, our problem is to transfer all the material that's available. We have about eighteen campuses in New York State that have sophisticated television production facilities. We have all the materials, but we have not found the money to consolidate the programs and facilities. We need to identify what's viable, and then to arrange these selected materials in a format compatible with delivery systems even on the campuses that do not now have closed-circuit systems but still could use these programs on very inexpensive playback systems. These are the problems.

Continuing education in the public schools of New York can serve as a prime example for the study of public school problems of adult education in general. There is very, very little money for adult education in the public schools. What money is given to the school systems comes primarily from federal funds for adult education and other special programs. And continuing education at the higher education level for the most part is self-supporting. We in New York State are more fortunate than our colleagues across the country, but I know what the problems are. We can charge all our credit instruction to regular instruction and research funds. Noncredit instruction for the most part has to be self-supporting. So when the expenses include supporting the production of materials and even of providing production facilities, with most continuing educators wondering whether or not there is use of these programs, the total costs are out of reason in terms of capabilities. And I talk not only from the standpoint of a state university person but also from the standpoint of a public school administrator.

One final note. We don't really know what we are doing in continuing education. There is no systematic assessment of who's doing what for whom. There are efforts by higher education, public schools, professional organizations, business and industry, and the churches; every conceivable social level and

agency in our society is involved. And the job is too big to duplicate our expenditures in human and physical resources. One of the starting points, I think, should be to find out who's doing what, where, and to what effects.

Al Fredette: I want to mention just briefly two things. Number one, in my comments earlier on this subject, I neglected to mention the areas that really make use of telecommunications across the board. What's involved isn't just broadcasting, radio and television, for instance, but combinations of media like the project developed under the Regional Medical Programs which uses data developed in the administration of community hospitals. This project uses existing technology very well (whatever your discipline I'm sure you're aware that the state of the technology is greatly advanced) through many and varied arrangements which range from combinations of films with tapes in cartridge form to cartridge film.

And secondly, referring to the terms broadgathering and narrow casting which were originated at the NAEB convention two years ago, the question of whether we are educasters or broadcasters was raised. We decided that we preferred the term mediacasters.

And finally, at the present time in the area of research in medical education as related to media, there has not been developed an instrument for measuring effectiveness. Again through a grant from the U. S. Office of Education Bureau of Research one of the first such instruments has been designed. It wasn't intended for this purpose originally, but it seems to function very well.

Richard Cortright: I'd like to comment on some remarks that Mr. Fredette made earlier. I think it is easy to become confused very quickly in this matter of technology. We must recognize the fact that there are broad bands of technology available to us, and, almost on a year-to-year basis, we have to evaluate which are useful in tandem or parallel. I'm not minimizing the importance of this. It's a difficult problem, I realize. But I think Mr. Fredette was getting in some aspects even more basic than this and which have policy implications. Coming back to this matter of motivation, let me put the points in the form of simple questions and ask you to react. It seems to me that you were saying that there needs to be a study of standards as to what a physician needs, or what any other profession needs in a given year and that this is going to change from year to year as more knowledge and information accumulates and changes. So, there

is a policy implication here of who makes the standards and enforces them as to what a physician or any other professional needs to know on a year-to-year basis.

The second question then would be what are the requisites of a continuing education to meet those changing standards.

The third question that stems from these first two concerns the policy of how you find the group which sets standards and the continuing education which provides the information to meet these standards. What is the needed policy for matching federal and state funds and individual fees from professionals to pay for this kind of continuing education?

And fourthly, this leads to the question of what different modes there are of delivering this information. We need to have policy set as to what the standardized form of these modes is going to be for delivering the information needed to meet the standards and requisites of continuing education.

Al Fredette: I think most of the people who are committed to medical education and especially in the area of physician education are hopeful but probably not too optimistic that this might come about. There is in the circles that I move in the hope that perhaps the professions can do it themselves without having it enforced. To say that there is definitely a need to know, yes, there is no question about this, and certainly the question must be faced of how to do this. We don't have the answers in this area. The Association of American Medical Colleges and the American Medical Association are both working in this area. I assumed that both of those organizations were members of the JCET; they certainly should be.

As to funding, we, as a private activity, take a very strong stand. We maintain that, again, it goes into motivation; physicians will indeed participate more actively if they have an investment. At least they put something on the line. We're underwriting at least forty-seven percent of our conferences six figures each year by contributions from the participating hospitals which receive most of the money they contribute from physicians.

And finally, standardization of systems is a development all forms of noncommercial broadcasting are going to be watching. We hope that out of the study of the Commission on Instructional Technology appointed under Title III of the Public Broadcasting Act of 1967 will come some guidelines in relation to

the development of what will have to be called new systems which would use contemporary techniques we're all familiar with used by themselves but which would combine them in different configurations.

James Robertson: What I think I hear us saying is directed at the formation of principles and can be stated something like this: That as educators of adults, our job is so big, not only the work we are now doing but the work we are not able to do, that we simply cannot hope to get it done without the new tools. Therefore, we in adult education must maintain a posture, first of all, of encouraging technical innovation, even though we may not be able to see what the applications are. Fifteen years ago if people hadn't said, "We need educational television stations," we wouldn't have them today. We didn't know fifteen years ago just how we were going to use these stations, and we don't know right now exactly how we're going to use dial access or the wired city or any of the other new developments. But it seems to me that all of us in adult education have got to start from the point that we have got to have help in using new technology because we haven't yet learned how to use it, and that anybody who can show us ought to be encouraged.

Secondly, we must continue to try to clarify our own educational objectives regardless of what technology can do for us so that we define a little more precisely what it is we're trying to do. Only by first setting our goals are we going to be able to determine how we're going to be able to use the tools. Television is nothing more than a communications distribution system. The computer is nothing more than an electronic storage and retrieval system. We've got to be clear about our objectives, and I think deciding what they are bothers me more than anything else.

And thirdly, we've got to make a persistent effort to keep current about what is going on and to experiment with the new possibilities that are being developed. There are always experiments to be watched, and those of us who are operators can learn something from the experimenters. And then also we must come to the understanding that every tool isn't going to be able to do everything, but if we have a whole array of new media, some of which may be applicable for one use and some for another, we can get the whole job done.

Lark O. Daniel: I'd like to talk about the teaching machine. The teaching machine has a great deal of promise, whether it is computer-assisted instruction or some more primitive form. It is well within learning principles in terms of reinforcement and in terms of response. The concept of teaching machines

has been well established by research. The fact of the matter is, however, that even though the system is now available to us, after it had an initial acclaim, a spurt of enthusiastic approval, it became dormant and is now little used except for these minor experiments in computer-assisted instruction. And the reason is very simple. In spite of such sophisticated teaching machines as the computer-based Mark IV, there was no material to use on it. There is no way to use the machine, there is no way to take advantage of its superior capability to stimulate learning.

And so this leads to a premise from which I would like to start, and that is, no matter how we define our problems or how we philosophize about what we ought to do, the fact remains that there is a finite number of dollars that is available for educational materials. From that premise, I reason that if we are going to have materials to use on these sophisticated systems, we must find some way to use the limited number of dollars with maximum effectiveness. Our task is to make some very concrete recommendations to JCET on formulation of policies.

Let me state a line of policy, which is to put on a voluntary basis or a required basis the cooperative production of materials. It is absolutely insane whether we're talking about primary, secondary, higher education, continuing education, or adult education for there to be hundreds, sometimes thousands of duplications for a particular course of instruction. The first specter raised when you talk in terms of cooperative productions is the idea of a national curriculum.

But I propose another premise, and it is this: For any instructional or informational course there is only a finite number of versions possible, maybe two or twenty or even one hundred and two, but not one thousand and two, not with regard to adult basic education, or adult education generally, since this is the group we are talking about. This is true not only of adult basic education and adult education in general, but also of primary, secondary, and higher education.

This duplication of effort results in the available resources becoming so diluted and distributed among the multitude of recipients that no one can produce information resources of desirable quality. I think that we should find ways to search out and promote cooperative efforts in the production of adult education materials. This may baffle some people, but I would suggest further that in some of the federal

grant programs conditions be placed to assure regional and national cooperation in the production of these materials and thus to maximize the availability of quality instructional materials.

Al Fredette: I'd like to digress for just a moment. On a very informal basis we've been able to develop over the past few years significant advances in institutional cooperation. Of the approximately ninety medical schools in the United States, we're collaborating with over forty. We're drawing faculty from forty institutions around the country in a very satisfactory working arrangement.

More and more federal programs are putting the responsibility on potential grantees to make cooperative arrangements. I mentioned the regional medical program previously. One of its strongest parts is the development of such cooperative arrangements as medical schools with hospitals, hospitals with communities, and physicians with junior colleges. There does seem to be some movement in the direction of cooperation.

James Robertson: As I view the situation, we are now seeing for the first time in the past two or three years an increase in cooperative programs. I think this comes largely from people facing the unhappy facts of interminable duplication. I don't mean that everybody is in this position, but we are beginning to see cracks in what was at one time a united front of isolationism. We've overcome inertia, but we want to increase the momentum. I think we can look at specific examples, such as California. The formation of the regional networks is another point. This has been in progress for six or seven years, but it is finally limping and breathing and walking and thinking.

Al Fredette: I don't know how many of you are aware of this, but in late January there's a national workshop for applying new educational technology to extension programs, and I'm pleased to say I've been invited to attend. It's a good sign that extension on a national basis now wants to look at all of the broad telecommunications potentialities, everything from correspondence potential to satellites and combinations of all these. This to me is an encouraging step because there's been a communications gap between the potential user and the potential distributer, and I think conferences such as that and this one are maybe beginning to draw them together.

There are two kinds of technology, or more explicitly, technology falls into two groupings. One is technology that is federally regulated, and the other, computer technology, for instance, that is not. It seems to me that with the broadcast side, with CATV which also is coming under FCC rulings, regulations have to be different. We have traditionally assumed that our devices use channels as a natural resource, and like minerals or wilderness a certain number of channels needs to be reserved. There's not necessarily a commitment that this space go to colleges or universities or to school systems, but it does need to be reserved for unpredictable public uses.

One of our chief dilemmas is that the Federal Communications Commission thinks of market areas, and now we introduce the category of service areas; the difference between the concept of service and market is tremendous.

Cy Braum: A case in point, of course, is the statement of Ralph Steetle which caused great consternation to the staff of the FCC years ago. His statement pointed to the need to reserve a channel for education at Sneadville, Tennessee. The reaction by the FCC staff was whoever would need a channel at Sneadville, Tennessee? Sneadville must have been number 5,000 on the nation's market listing. But in terms of a state network service, it later proved to be a crucial reservation, and it is in service today. We need state plans, but this gets us into interesting semantic problems because we no longer study the state needs until the federal government has the money to pay for the study, and we then begin to plan state needs in terms of this money. I'm a real federal dollar spender. The role of the state government is often the application and dispensation of federal monies. For example, if you're interested in a course in teacher training with federal funds, there might be some minor adaptations from place to place, but I can assure you that teacher training courses would be replicated throughout the nation wherever funds might be obtained to do such a course. And I can also predict that the courses will all be done rather inadequately.

John W. Meaney: I recall that within the last few years an NEA Commission* made a national policy recommendation that as a nation we commit ourselves to three additional years of preschool

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*Educational Policies Commission.

education, and to two years beyond high school. There were immediate outcries about the implications of this proposal. Here we have essentially in the school system a twelve-year operation, and this proposal would extend one end by three years and that's a twenty-five percent increase. And then on the opposite end, the proposal would add two more years.

We've been talking about professional and adult education, essentially university-based education, which, as compared with the proposed extension, amounts to a fifty-year extension, or a lifelong continuing education commitment. Is it realistic to assume that the universities as now organized can really fulfill this entire function? Who's going to do this? We've talking about universities that have commitments to four years of undergraduate, maybe four years of graduate and professional education, an eight-year operation suddenly extended to a fifty-year operation! Is this realistic?

William R. Dodge: First of all, we're not talking about everybody being in school at the same time. But people do change careers two, three, and four times, and people are automated out of jobs every day of the week. These kinds of developments lead to a need in continuing education, a continual process in techniques, in procedures. I think this is a very realistic thing; not only that, I think we're going to have to deliver because we can't expect tax dollars to come in unless we're providing the necessary and expected services for the people who are earning those tax dollars. In other words, if education says, this is our cut of the pie, the eighteen- to twenty-two-year olds, it is not going to get strong public support. It will have to furnish the educational experiences and activities, or at least do its fair share of it, for the post-college-age person. One of the points is a moral one: If a university prepares anybody for any kind of profession today, should not that university accept the responsibility of keeping that person informed of new developments?

Ralph Steetle: Another way of saying this is that the universities, both public and private, must begin to think of their student body as the population of their area, whether they are currently on or off campus. They will use technology to extend broadly the influence of the campus, whether a student is physically there or not, but it is inconceivable to think of compressing into those eight college years all the learning these students must have.

From the floor: Higher education does not have the whole burden of adult education; in fact many public school systems have quite elaborate and extensive programs of adult education.

There is a wide spread of difference between the work of basic literacy training and the continuing education for professionals; there are tens of thousands of occupations that are not professional, and yet those people need continuing education. There are many people who are neither illiterate or professionals who need leisure-time activities and vocational education. Adult education is certainly much broader than what the university may be willing or able to accept.

John W. Meaney: Let me ask a question about professional education, even where the commitment is huge. To what extent do you feel that this could be programed and served automatically out of what the institution is already doing anyway for the people currently in training? I'm thinking of the kind of operation that would allow the professionals in the field to look over the shoulder of current instructors in many relevant fields.

From the floor: That was the point I wanted to make for the conference recommendations. Let me respond very briefly. In telecommunications much has been done with the regular instructional program for the eighteen- to twenty-two-year olds, the normal age of the undergraduate student, but in any continuing education program for the post-college-age person who has been working five, ten, fifteen years, the situation is very different, and it is not possible to transplant material from the undergraduate level into an instructional program in adult education with much hope of success. Adults are more highly motivated in many instances and are more prone to question concepts critically, and thus part of any pattern of cooperative development of software for telecommunications should give consideration to the nature of the audience that is going to be the target group.

From the floor: JCET really fronts in two different directions, does it not? It needs to provide its constituent organizations with leadership which they then can accept and support. Then, in the other direction, it represents, in effect, those organizations and constituencies in confrontation with the FCC and with various other groups and provides a forum for the sharp challenges of new developments like satellites.

COMMISSION III

Telecommunications and Continuing, Professional, and Adult Education

REPORT AND RECOMMENDATIONS

Since American education has demonstrated regular and substantial use of noncommercial educational radio and television broadcast channels and also the frequencies reserved for the Instructional Television Fixed Service; and since more and more colleges, universities, school systems, state telecommunication agencies, and independent, nonprofit corporations devoted to educational telecommunications foresee the necessity for greatly increased use of electronic technology in the future if America's educational objectives are to be realized for all her people; and since the Congress of the United States, in passing the Public Broadcasting Act of 1967, has established as public policy the encouragement of electronic media utilization in American education; we of Commission III recommend that JCET, acting on behalf of and in concert with its constituent members, take the following action:

1. Secure the reservation for noncommercial, educational use of a proportion of all newer telecommunications facilities, such as satellites, roughly equivalent to the current reservation of public television channels.

2. Advance in every possible manner additional long-term and continuing research into the educational application of new telecommunications media, particularly in multimedia combinations, and disseminate broadly the results of such research.

3. Encourage communication authorities and industrial leaders to develop and demonstrate at the earliest practicable time a system of two-way cable communication into the American home in order to provide an interactive mode of telecommunication capable of opening the potential for developing a truly humane democratic society with full and direct citizen participation on a continental scale for the first time in our history.

4. Explore the possibilities of establishing or evolving technical standards in the field of telecommunications, e.g., in helical scan videotape recorders.

5. Establish among the educational institutions and agencies of America a climate of opinion for, and a means for carrying out, cooperative production of instructional materials by interinstitutional pooling of resources.

6. Establish policies, among private and government agencies and foundations which will permit and encourage, as appropriate, the pooling of resources and the cooperative production of instructional materials.

7. Initiate conversations, studies, and joint explorations with institutions and organizations involved in continuing education for the purpose of identification, evaluation, and utilization of new telecommunication resources for adult education use.

8. Expand JCET membership to include all national and regional educational associations and agencies which have a direct involvement in educational telecommunications.

COMMISSION IV: Telecommunications and Urban Education and Urban Problems

Moderator: William G. Harley, National Association of Educational Broadcasters

Animateur: Elizabeth D. Koontz, National Education Association

Summarizer: Robert L. Hilliard, Federal Communications Commission

William Carlisle, National Association of Broadcasters

Robert A. Cox, University of Pittsburgh

Daniel DeLange, Office of the Governor, Florida

Herbert Dordick, System Development Corporation

William Duke, Office of Senator Javits

Frederick Ford, National Cable Television Association

Winston Franklin, Charles F. Kettering Foundation

Jack Kleinmann, National Education Association

Gladys E. Lang, Center for Urban Education, New York

Kenneth D. Roose, American Council on Education

Mark Smith, American Association of Colleges for Teacher Education

Douglas Talbott, Cox Broadcasting, Atlanta

Franklin Walter, Ohio State Department of Education

Murray Wigsten, EDUCOM

Joseph B. Wolpe, Jr., General Electric

COMMISSION IV

Telecommunications and Urban Education and Urban Problems

OPENING STATEMENTS

Robert L. Hilliard: Before I assume my role as summarizer, I wish to make a statement on the make-up of this group and its purpose. To me this is highly important.

If we are to deal with urban problems and if, as many of us think, the urban problems center around black ghettoes, then I would look around this room and I would ask how many black and brown people are there here who are living and working in the ghettoes? How many white people are there here who are living and working in, or have lived and worked in the inner-city ghettoes?

How competent are we, as a group, to begin to make any real kind of judgments or to suggest action as to what should be done concerning communications in the inner city?

William G. Harley: . . . I assume you intend your statement to be taken as a set of rhetorical questions. The answers are quite obvious. It is an indictment, I think, and a well deserved one. We don't have sufficient involvement of those who have really lived through these experiences, and who also represent minority groups, which are the ones most affected by our discussions.

Nevertheless, I think we do have tremendous capability, at least from a technological standpoint, and ultimately we ought to be able to come up with pertinent recommendations, perhaps not as many as we might if we had wider involvement in this conference. . . . But we do have a breadth of experience and capability represented in this group, and also a degree of expertness to bring to bear on these problems of urban education. At this point I call on our animateur, Mrs. Elizabeth D. Koontz, to open our discussion with some remarks of her own.

Mrs. Elizabeth D. Koontz: . . . Mr. Hilliard has already made one of the statements that I had prepared to make, except that I would have added, "those who are in education directly in the ghettoes."

It seems to me that sometimes perhaps we look at urban problems as being directly concerned with those to which we give most vocal attention, while the sociologist may see them from a completely different standpoint, and certainly the psychologist recognizes another aspect. Herein there is an area of failure on the part of educators and those who are concerned with the content of our educational systems.

The failure is that we tend to look at problems from only one standpoint, and that we seek to find solutions that do not adequately cover the complexity of the problems as they are related to the people concerned. As teachers in the urban areas, or the semiurban or the rural, or the small-town areas, we find the same situation: education is not doing the job. And as educators we must accept a part of this responsibility.

But we do not accept all of it, mainly because there are many other factors that affect education that we don't seem to be able to muster the strength to face.

For instance, I think there are many people who, in a way and a very nice one I must say, speak about the reason education has not been effective, and they inevitably say that the teacher is not equipped to do the job. In the area, certainly, of communications, of telecommunications as we are using the term in our open forum today to include satellites and like advanced modes, we tend to think that failure is due to teacher resistance to the idea. I believe that this is only one factor.

When these new kinds of media were introduced, there was a sales pitch given to many superintendents, administrators, business managers, or those who had the responsibility of making purchases for school systems that, in effect, this would make unnecessary their having to hire additional teachers, because these devices were going to make teaching more effective and to promote independent learning.

I think there are a lot of people who are promoting this idea who never realize the fact that there are many more children, that the media have exposed them to a world far beyond the confines of their own areas, and that the complexities of transportation and communication in general have already brought to them new ideas.

There has also been the depersonalizing of lives generally, and yet we still cling to many traditional patterns of organization in schools. Perhaps the one thing I hear most from educators is the fact that we set up special projects, we institute new ideas, and new processes and procedures. And they are theoretic successes, and then we propose them for the school system, and we wonder why they don't work.

Well, the reason they don't work is that when we set up a pattern we adjust all of the other factors to allow the media to work; we are not willing to make the same adjustments in the total system. First, this would cost too much. Second, it would cause a kind of massive reorganization that we can't undertake in a limited time. Yet, the teacher in the classroom is expected to use these media, to see a real benefit from them, and to continue to produce results.

So I think we are beginning to realize why there seems to be an apparent resistance on the part of educators, teachers especially, to much of educational technology. But now I would be remiss if I allowed you to think that this is the only reason why technology is not accepted rapidly.

Teachers are afraid of "new" media. They have had little or no opportunity to learn about them. Six weeks in a summer institute, with one introduction by a consultant who comes in and demonstrates in thirty minutes how media can be applied to every subject in the curriculum, are not a long enough exposure. Neither is a four o'clock demonstration of some new piece of equipment that's supposed to allow each teacher to be creative and to design his own program, simply from seeing the routine operation of the machine.

I would be remiss also if I failed to mention that the resistance is not only from teachers. It also comes from those responsible for arranging schedules that operate within a pattern somebody decided upon some time ago for the number of minutes a child is supposed to sit in the presence of a teacher who is supposed to be expounding on a certain subject area. The mechanics of scheduling provides all kinds of complications.

When we begin to talk about independent learning, how can we be assured this will satisfy the sixty minutes per day that are required for a designated subject, or the one hundred and twenty minutes per week that we must devote to another. We are constantly reminded that these requirements must be met.

This doesn't take place in all systems, but it does occur too frequently for us to write it off as a major factor in teachers' unwillingness to change or to learn to use new methods. We all change according to the ease with which we can make the change. If it disturbs us too much, then there is a feeling of the likelihood of failure. On the part of teachers, there may be failure already. The results achieved indicate this to be the case.

Mr. Frankel mentioned one point that I call attention to specifically: What is the role of education? Will it be education that demands of the communications field what is needed to do the job, or will it be the communications field which will determine what education is going to be and how it will be taught?

I raise this question because there can be little or no doubt that we have not had the demand coming from the educators. When the farmers within the Southeast region needed certain kinds of information to deal with the boll weevil and soil depletion, they went to the universities and asked them to design the kinds of programs they needed to get the instruction to the farmers. This has not happened in education. And yet I think it must be thus, if education is going to become the productive resource it is capable of being.

I don't pretend to be a person well informed in telecommunications, but there are people employed in the school systems who are. I am an educational specialist in my area, and I should be able to say what I need to have done in my classroom and ask those who are skilled in these areas to design the kinds of machines or whatever I need to accomplish the goal that I have described.

But this is not happening, and I have been told personally by many that the reason it is not happening is that teachers are not asking. They are too slow in demanding it, and they don't really see any hope that they will get it in the future, which brings me to another facet of this problem.

And this is that with the other factors involved we must keep account of the major one. We will not get this kind of thinking by educators until there is time in the school day for educators to do that kind of thinking. There will be no progress if educators are expected to do it after four o'clock. There was a time when there was a free recess period when teachers got together and learned from each other what there was that would help them. There is no free period now. Teachers are monitoring halls, taking care of

lunchrooms, and similar nonteaching assignments during lunch hours. People in the sciences are not having planning periods at the same time. They are probably having a planning period when something else is happening, and this does not enable the people in science to combine their thinking. . . .

Consequently, as we look at urban problems we realize that this whole business has come upon all of us suddenly in spite of the research and the data that were available. The problems have come upon us so fast that now we are looking for mechanical means for solving the problems––even though one of the problems has been the dehumanization process that has taken place in urban areas leaving people to feel that they have been forgotten. Technology has made heavy demands upon the schools, but the technocrats are the same people who seven or eight years ago weren't concerned too much. But then there was no problem of their children getting employment after high school. It was possible to go to work in a factory, but now the factory is no longer the place where one can simply apply the use of his hands and learn the skills. It, too, is automated.

The machinery to help a person who reads very poorly costs too much to allow the learner to operate it. And so there is a pressure now for the schools to be more effective in the learning processes of children.

But we aren't talking just about the processes of learning for children in urban areas. We are talking about the learning processes of adults, too. We know that unless there is stimulation from home there will not likely be a great deal of productivity in the schools. And so we are talking about the kinds of programs that help adults adjust their lives in an urban society from which many have been excluded by virtue of their own poverty, by virtue of their own illiteracy, and by virtue of their being strangers in a new world.

And I think as we look at the urban problems, we make a great mistake if at the same time we do not prepare for the rural ones, the semiurban areas, the small towns from which the people in urban areas came and will continue to come unless there is satisfaction where they live and in the things that they can do. So that the urban problem is not only within the city; it is within the entire nation and in every hamlet.

And perhaps the place that we need telecommunications most, or the mass communications media, is not so much in the urban areas but in those widespread areas, the small school districts that are

still attempting to give their children a total educational program on too limited funds under separate managements and with little or no cooperation.

And so, as we look at the matter of the urban problem, we are looking for the panorama and the intricate nature of the problem——not simply the formal education problems, but the kinds of influences that will allow people to learn concepts which we've never before realized they may be lacking. How one adjusts to his society must become as much a part of education for adults as it is for children or for young people.

How does one find a personal relationship when today, with the great mobility of our society, one has a neighbor for perhaps six months, and afterwards that neighbor moves? What happens to the institutions that used to bring people with common bonds together? And where do we look for these compatible groups of people? Do we expect to bring them out of their living places, or do we expect to go into their environment, to accept them as they are instead of imposing what we think they should want done?

The goals of education and those of the people it serves are not always synonymous, and perhaps in this area the schools have the greatest job to do——in making synonymous to some extent the goals of the people involved, and the goals of what we consider education to be.

COMMISSION IV

Telecommunications and Urban Education and Urban Problems

GENERAL DISCUSSION

Robert L. Hilliard: We need to ask what are the problems in the ghetto that communication systems can help solve. If we were to ask people who live in the ghetto what are the three most important problems, I think that on virtually everybody's list would appear three things: jobs, housing, and police protection.

William G. Harley: Of course, jobs imply that the people need to be educated properly to fill them, thus education is a major problem.

Herbert Dordick: There is considerable evidence that the electronic media are replacing the print media as major sources of information for many people in this country. Some surveys have shown that this is more true among ghetto dwellers than others. They do not usually read newspapers and magazines, but they do watch television. Therefore, if you want to get information to these people about jobs, if you want to tell them where health services are, if you want to tell them what's going on in their schools, if you want to give them a feeling of community––the best way to do it is by the electronic media: television, radio, and telephone.

Certain kinds of information are best transmitted by television (broadcast and cable), others by radio, others by telephone. We need to increase our use of these channels in the inner city and to test their effectiveness and their relative costs.

From the floor: Radio is a means of telling people about jobs. It is clearly available to people, but its usefulness varies from city to city. In New York the black radio stations are apparently not accorded much credibility. In New Orleans, also, the people who heard of jobs advertised on the radio would avoid those jobs. On the other hand, in Los Angeles there is a station which is accorded credibility. The people do pay attention to the job advertisements that they hear over this station. Now what's the problem? It's not only of communication purely.

Maybe the Department of Labor should spend money buying job advertising time on some of the black radio stations.

William G. Harley: This brings us into a discussion of what medium is preferable, and this question relates to credibility. I've seen a television program using an acknowledged criminal, a man with a criminal record, a black man and a white man together, as co-hosts of the show. And often they bring on government officials and others who are in positions to talk about particular job categories, and particular training procedures that are available. People also have the opportunity of phoning in and talking to these people. But they can see them. They see that this is a black man. It's a very delicate kind of rapport that has to be established between the white and the black folks and the viewing public. They've learned a great deal over a period of two years now, and there seems to be some indication that they may have filled something like a thousand jobs already through this approach. But I don't think you can say that radio is not as good as television here because there are other considerations like the availability of receivers. They're both useful.

From the floor: Let me quote the latest Roper figures: The most important source of news among Negroes in 1967 was television—seventy percent of the Negroes preferred it. In second place came newspapers, and third radio. And on "believability," in 1967 among colored people (and I believe these were all ghetto people) sixty-one percent believed what they heard on television; fifteen percent in newspapers; and six percent over radio.

Gladys E. Lang: I'm glad you quote Roper because I trust his surveys more than I do some of the other surveys; but all of these surveys have the problem of not really reaching the lower depths of opinion. I've recently attended a meeting between university people and community people, talking about how you reach ghetto residents. And there they were discussing not only television but local newsletters. They have started a Harlem newsletter. The question is where to post the local notices; one at the barber shop, one at the beauty parlor, and so forth.

From the floor: The reason the Washington experiment has been so successful up to this point is that before it was started the station got the ministers, the OEO groups, the black united front, and

everybody else out to tell people through word of mouth, and every other means they could, through the pulpit and newsletters and so on that on this station, at these hours, every night, there would be a job review program. I think that's a prerequisite of everything we're talking about. Any kind of device we use has to be spearheaded. We have to keep on getting the community leaders involved to tell people what is available. And when they get information from somebody they trust, whether it's the barber or the man who runs the corner store, it has an effect. What have we learned from all this? We've learned that there have been some successes and there have been some failures. Chicago had a failure with their Jobathon. Los Angeles had a failure because it really wasn't a job program. Washington is successful.

We learned that radio is good in some places. Putting posters on telephone poles may be even better somewhere else. Getting the ministerial group involved in some communities is very important, but in other communities the ghetto people are more sophisticated and they don't want to go to the minister.

The other thing we have learned is that we should have some pilot projects to do some exploratory research.

William G. Harley: Well, that's an appropriate recommendation to make. I just wanted to build on what we're both saying in the sense that it is perfectly clear that the communication technology is not enough by itself to do all these kinds of things. But how it is applied, what sorts of procedures and techniques, and what kinds of people are involved; all these things are very important. And one of the things that educational stations surely are finding out is that you have to learn this capability. And it takes a long time. And you've got to get blacks involved and give them the opportunity to work with the programs. There are really two aspects to this. One is just information about jobs and job training. Much of the WETA program in Washington relates to how to become a key punch operator, and where to go for the training, and who is the sponsoring organization. But the other part is the training itself which the media can do.

Gladys E. Lang: I'm somewhat alarmed because we are concentrating exclusively on the problems in the ghetto. I don't think you can separate out the problems of the ghetto from the problems of the other schools in the rest of the city. I think New York City is an example of the horrible situation which comes

from this kind of thinking. If you don't consider the whole thing together, you are going to have a complete breakdown in communications.

From the floor: One of the problems in the ghetto is the education of teachers for ghetto schools. I think that providing this specialized type of education using some pattern of telecommunication is about the only answer to the problem. Let me illustrate: In the state of Illinois, Chicago is the city that has the largest ghetto area. Most of the teachers in Chicago are prepared by five state-supported institutions, all of which are sixty or more miles from the city. At the present time, these institutions are trying several ways to get their teachers involved, even in a small way. One institution, for example, is trying to get the money to provide every one of the six hundred or more teachers that they graduate every year with a two-day experience in an inner-city school; and they are having difficulties doing this. And the difficulties can be magnified the further south in the state the teacher-training institutions are located. Telecommunications offer the possibility for helping teacher-education institutions give student teachers reflected experience in the inner city, its problems, its schools, with all of the situations related to the education of boys and girls in which they might find themselves working at a later time without previous confrontation.

Robert L. Hilliard: I've been working recently with some of the inner-city people in Washington, meeting with a diversified group, from the hard-core militant to the black establishment people. And at one meeting when I was making a case for the great potential of the communications, and particularly the medium of television, to solve some of the problems, a parent very angrily said, "That's a white man's bag! What are you getting into this stuff about television for? My kid goes to school and his classroom is in the basement. When it rains, the basement is flooded and the kids have to come up onto the first floor. Then everybody under that roof comes out of there because they're afraid that roof is going to collapse. And you talk to us about television?" Well, this is a physical, pure basic physical, need that these parents are concerned with.

From the floor: There is a distinct need for schools to communicate with parents, with children, and with the people in the community. Surveys that we've done, in several different cities, have shown that the major means of communication between the school and the parents are their children. As most of us

know, children are relatively poor transmitters of information, inadequate, anyway. And the parents, especially in the inner city, are desperately in need of knowing what is going on in the school. They want to know what their children are learning. They want to know the teachers, what the teachers are thinking. They, too, would like to know something about the innovations and get all the information about the schools that is possible. So there is this need for community involvement in the schools. I took part in a discussion in Los Angeles where we were beyond the point of facilities and were talking about program and people innovations. And both black and brown parents said, "We don't want our children taught by substitute teachers. We want real teachers. We don't want this kind of paraprofessional." So, even innovations are raising questions.

Daniel DeLange: This morning it was said that we're really going to have to help the home before we can help the child. We are very much concerned about this in Florida because, as you well know, there is perhaps a greater need for adult education than in most other states because so many adults who are senior citizens needing service have moved into the area. Last year one out of nine high school diplomas was given to an adult over twenty-five; and I think that fact speaks very well for what we are doing, and yet there is so much more to be done. I'm interested in possible ways of educating adults wherever they live by using technology. However, there are in the central city not only many people living but many more people working. How could we set up store-front education where people could come before work, during noon hours, or an hour during work or after work? Could they take courses right then and there and go home?

One example of how it should **not** be done is Hillsborough County, which has no junior colleges. Instead of a plan like Miami-Dade, which has two campuses for twenty-six thousand students--the county's philosophy is that there will be no campus bigger than five thousand, and its long-range plan has five campuses. Working with the county planners, we find that none of the five is an urban campus. All of them are suburban campuses. It's hard to point out to them the needs of urban education--what it can do for these adults in that area as far as suitable jobs are concerned.

Kenneth D. Roose: Another problem concerns the education of the white student. It's not only the training of teachers but the entire undergraduate program. This is a dimension which would involve suburban liberal arts colleges and colleges in out-of-the-way rural areas. We must do something about the

curricula of these institutions so that they become involved in the whole urban problem and its ramifications. Solutions to urban problems are not solely to be found in changing conditions in the inner city but in the whole ring of steel surrounding the central city. Therefore, we need some way of integrating or getting learning resources of the city into the classroom for all college students, not the education majors alone.

Gladys E. Lang: Robert McLean of England writing about television and education said that what was different about telecommunications and television is the fact that it is possible to be in two places at the same time. We're moving toward a segregated society, and we have somehow to expand the horizons and experiences of people, we have to find ways to connect the suburb, the white population, and the inner city. There is always a communication problem among large numbers of people, between students in the suburbs and students in the inner city. There are any number of suggestions as to how this dialogue could be set up. One way is to create a kind of telecommunication integration. The whole problem revolves around how––if you can't move people, can't move students, or teachers, how is it possible to expose the black children to white teachers and the white children to black teachers? This is something that is terribly important.

Another problem is the whole question of the breakdown of public confidence in the public school system in larger cities, and this involves the entire area of how news about educational developments is getting to people. The Ford Foundation and other foundations have been involved in this whole question about commercial television, especially disseminating news of education in the ghettos. But maybe the Public Broadcasting Corporation ought to see that part of its job is to define a concept of educational telecasting which is not crisis reporting but presenting a true day-to-day picture and then to publicize the problem somehow to the community, so that it can contribute to what parents should be thinking about. Parents need to find out what the consequences are. They hear about team teaching, or they hear about telecommunications, but no one has told them what problems they should attempt to solve.

From the floor: The truth of the matter is that no matter how much noise you hear about the ghetto there is very little useful information. There is the old leadership pattern. The ghetto dwellers listen to their leaders. This is true everywhere. In a survey of ghettoes and adjacent white communities, we found

that in the adjacent white schools there was even less communication than in the ones in the ghettoes. The problem is universal. People in cities very rarely talk to each other.

Robert L. Hilliard: More and more I have been hearing from black people in the ghettoes: "The missionary area for white people is not in the ghetto but in white suburbia."

Robert Cox: In our educational television efforts in Pittsburgh we've been told rather candidly by the blacks: "Shut it off because we're not watching, and we're not going to watch. You're wasting your time because it's Whitey telling us, and we've been having Whitey tell us since we were born. Why doesn't Whitey start telling the whites?"

We've proposed an innovative scheme that might be given some consideration here. We put blacks on the screen who were very articulate, almost Oxfordian Negro announcers, community specialists, and other highly educated persons. The response from the intended black audience was negative: "Why don't you take those of us who didn't get pulled out of the slums under work-scholarship or similar programs and sent to Harvard, or Yale, or Pittsburgh, or whatever. Why don't you take some of our bright people who were too old or unable because of various reasons to get the kind of a formal education that makes black men acceptable to whites, that gets rid of our dialects and eliminates our accents; why don't you take some of us who are working and living daily with the problems, and teach us how to use the medium and then let **us** use it." So, WQED—TV in Pittsburgh, through Harold Wigren and the NEA, proposed and coordinated a plan to set up a community and educational broadcasting laboratory in which there would be a curriculum to train on-camera television teachers at the post-graduate level. We're proposing not only to train on-camera television teachers but into this same program to bring intelligent people who might not ordinarily be accessible to universities for the same kind of training plus additional tutorial areas in which a need exists. Our purpose is to make them able to use community broadcasting. In other words, we are training people not only to be presenters but to become able to develop programing material, and then to put it together for their own ghetto audiences. Maybe this way they'll start talking to each other. Maybe this area of leadership which is now dominated by a relatively vocal minority might be broadened into perhaps a less articulate but more concerned majority.

Herb Dordick: When we use the word, education, are we including information? Because especially in the inner cities, there is the issue of the people getting to know what the jobs are, whether or not they are qualified for welfare. In middle- and upper-class society, a person wanting to know what his social security benefits might be or what he is entitled to after retirement goes to his insurance man or someone else who can give him the facts, but in the black or brown ghettoes or in sections of inner cities where the white poor live, there is no place to go. As Michael Harrington said, "What we have developed is socialism for the rich and private enterprise for the poor."

Daniel DeLange: Relating to the question of motivation, we had a Jobmobile in a ghetto area in Florida, and it was supposed to excite the people about getting a job and to make it easier for them to do so. All the application forms, all the jobs that were available were recorded in this Jobmobile, and anyone could come in and have an employment interview. To begin with, the program was very successful because it was new, but now it has been discontinued. Nobody was interested. Our unemployment rate is still high.

In Miami Beach, as you well know, there are many hotels, and they are greatly in need of help. Most jobs are unskilled; they need people to work in the kitchens, for instance. We designed special programs of adult education to train people for these jobs. A large number of people in the ghetto areas who really wanted these jobs signed up, both black and white. They needed two or three weeks of down-to-earth training and this was provided at no cost to them. There were 400 jobs, with 500 applicants. The prognosis looked great, but when the program got underway fourteen people showed up!. There was an antimotivation force at work. Certain of the people and leaders in the area told the people who signed up not to stoop that low, to choose unemployment to that kind of job.

From the floor: Moving to another area, there are two Mexican, Spanish-speaking radio stations in Los Angeles and on one, if they were to announce at 12:00 noon that it was daytime, no one in the ghetto areas would believe them. On the other station, if they were to announce at 12:00 noon that it was midnight, the ghetto dwellers would believe them. It's a matter of credibility. There is a black station in Los Angeles, which is highly credible. It's not black-owned. There are very few black-owned stations in the country. It is on this highly credible station that job advertisements are given.

The Crime Commission report sets up a hypothesis that improved communications might cool off tensions in inner-city areas if information rather than rumors could be presented. I think this is a good hypothesis. I don't know whether it has ever been tested. I do know that in some communities after Martin Luther King's assassination there was essentially a black network set up, and ad hoc network, which linked together by telephone lines many, many black stations throughout the country. This network was given credit for having kept things cool in several cities.

Bill Carlisle: I'm here as an advocate for all broadcasting, whether it is educational or commercial, an advocate, if you please, of free broadcasting; free television service where it is receivable at least, for all persons in the ghetto, without any need for payment of any kind. But I'm not here as a proponent for any new technology, including CATV. I think that our future is going to consist of an integrated communications system complex which will include broadcasting, because I think a viable broadcasting industry--both educational and commercial--will continue to be with us in our lifetime. In different stages of development are CATV, satellites, lasers, wave guides, retrieval systems, and storage tubes where a tube will store any material (this exists today, by the way). It seems to me that the keynote speaker this morning indicated that we don't want to resist everything nor do we want to pay homage to these developments. We neither want to resist them nor do we want to deify them. I don't deify CATV any more than I do broadcasting. But I want to make clear this one point to everyone concerned: television is very expensive and talent is limited, whether you are running a public broadcasting station or a commercial broadcasting station or if you are going to originate on a CATV station. Now the $5 a month people pay for CATV is basically for what CATV originally was and largely still now is. That is their fee for reception service, consisting almost totally of off-the-air television stations whether they are picked up from nearby or from long distances by microwave. Once you start getting exotics, particularly two-way exotics, you are no longer talking about $5 a month. It seems to me that should be taken into consideration. Programing, as I said, is expensive, and programing over a cable runs into considerable money. Someone has to pay for it, and in the ghetto areas who is going to pay for the installation and for the monthly charges for a cable hook up? You might say advertising would support CATV, but this is a chicken-and-the-egg proposition. I'm not an opponent of CATV; in fact, I think it's great as a supplement, but I am an opponent of an all-cable system. If that is to happen, and it may happen some day, it will become a matter of national policy. It will

necessitate a complete revision of the Communications Act, but at that time the communications system which will probably go out for bids will wire this country together on a grid system. That is the fairly well-known wired city concept. It is not CATV as we know it today nor as it is projected tomorrow by Fred Ford's very fine presentation.

Winston Franklin: It seems to me that "communication" isn't quite strong enough to describe what cable might produce for us in terms of more citizen interaction.

COMMISSION IV

Telecommunications and Urban Education and Urban Problems

REPORT AND RECOMMENDATIONS

The following statement was approved by the commission. Present but not voting: Carlisle, Ford, Talbott, and Volpe. Dissenting: none. Concurring and issuing additional statement: Hilliard (concurred in by Koontz and Harley).

The commission, in reccgnizing critical urban needs such as jobs, housing, education, social service, human relations, community relations, cultural realization, personal protection and self-determination, urges the serious examination of the role of telecommunications for aiding in meeting these needs.

The commission identified the following general functions of communications technology as applicable to the needs stated above: to inform, to educate, to influence, to entertain.

There have been individual instances of strong efforts and some successful applications of communications technology to the solution of urban problems. What is needed is a coordinated program of research, implementation, and evaluation to determine which media performing which functions can best meet any given urban need.

This commission recommends that a comprehensive approach to the use of communications technology be undertaken in one or more selected "model city" programs. The principal purpose would be to concentrate resources on producing programs and materials meaningful to the people directly affected and should include involvement of these people.

The commission believes that there presently exists among various federal agencies authorization for programs pertaining to a number of individual urban needs. We recommend that the administration select an appropriate locus for implementation of this program, in cooperation with private industry and foundations.

We further recommend that JCET take whatever action is appropriate to implement this recommendation.

COMMISSION IV

Telecommunications and Urban Education and Urban Problems

ADDITIONAL STATEMENT

This commission operated under the handicap of attempting to deal with urban problems without having a representative from the inner city on the commission, and of directing its attention to areas primarily affecting black people without having knowledge of their attitudes and feelings, or of those of all the other minority groups involved. We wish to make it clear, therefore, that these recommendations must be weighed in terms of the degree to which they relate to the problems of the people concerned, and that any implementation of these recommendations must be oriented toward an acceptance of the needs and desires of the people concerned, in their environment, in terms of what they want done, and not imposed in terms of what we think should be done.*

Robert L. Hilliard
(Mrs.) Elizabeth D. Koontz
William G. Harley

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*JCET sent invitations to national leaders in the black community and among these were individuals who understood the complex problems of urbanization and education. Unfortunately for the conference, demands on the time of those invited made it impossible for them to attend the conference in Athens, Georgia.

COMMISSION V: Telecommunications and Rural America

Moderator: Wesley Meierhenry, University of Nebraska

Animateur: Benjamin Carmichael, Appalachia Regional Educational Laboratory

Summarizer: John Walker Powell, Office of Economic Opportunity

Patrick A. Bergin, General Dynamics/Convair

Wally Briscoe, National Cable Television Association

C. Ray Carpenter, The Pennsylvania State University and The University of Georgia

Frank Cyr, Rural Supplementary Education Center

John H. C. Dysinger, General Electric Company

Samuel Fordyce, National Aeronautics and Space Administration

William Guiton, Southern Bell Telephone Company

Richard W. Hesselbacher, General Electric Company

James Miles, Purdue University

Matt Nilson, General Dynamics/Convair

Emil Steinhardt, West Virginia University

John D. Sullivan, National Education Association

James Templeton, Office of Economic Opportunity

Edward Vause, Charles F. Kettering Foundation

Harold E. Wigren, National Education Association and president, Joint Council on Educational Telecommunications

COMMISSION V

Telecommunications and Rural America

OPENING STATEMENT

James D. Templeton

Nearly half of all Americans live in small cities, small towns, and rural areas. The cliché that seventy percent of the total population of the United States is urban rests on the antiquated and misleading assumption that any town of 2,500 or over is "urban." Correcting this to make 50,000 or over, including the immediate suburbs, the urban base, we find that forty-six and one-half percent of our people are really rural.* If the 1965 population figures are corrected for this base, there are eighty-eight million rural Americans.

Of that number, twenty-two million--one in four--are below the poverty level.** Broadly taken, this means poverty of all kinds: hunger; bad housing; poor medical care, or none; poor and abbreviated schooling.

In addition, the whole rural population is badly underserved by the important media of information and communications. The map of educational radio stations shows them concentrated in and around the great metropolitan complexes of the East and West Coasts and the Great Lakes cities. The immense barrens of the Great Plains, from Alberta and Saskatchewan to Mexico, and a broad belt of the South are totally without service from educational or public radio. State ETV systems in some states relieve this drought for school children. But the rural adult is severely handicapped by a meager and impoverished press and a variety of useless commercial radio stations. These millions are, in short, utterly excluded from the mainstream of the national conversation.

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*Based on Harold Wolman's article in the October 25, 1968 **Commonweal**.

**__The People Left Behind__, Report of the President's National Advisory Committee on Rural Poverty, September, 1967.

Yet, these people elect more than half the Congress--over fifty percent of Congressional districts are rural and small town--and decide the election of Presidents. They send their children, ill-prepared, to swell the misery of the cities.

Together with employment and health care, the pressing need of rural America is **information and education**--the two faces of the same coin. And this need is the need of all of us. We may not hunger when the rural poor are unfed; but we all suffer the consequences of their mental and social impoverishment.

Radio is the keystone of rural public communications. It can be supplemented by television where there is a large enough population within the coverage area; but in many parts of the Great Plains the population density is two persons per square mile. Radio can be supplemented by Telpak--most farm homes now have telephones, but not most country dwellers at large. Line and cable networks with dial access to data centers are needed, too. Such systems are proving to be vital in the planning for rural medical care delivery systems. It is a necessity to locate vocational training at local sites, without requiring travel to distant centers. In the end, the communications grid serves government, law enforcement, education, rural area organization and development--all major phases of community life and all vital channels of communication with the isolated rural or farm family.

In a matter of months, communications satellites will be over the eastern and western halves of this country. At least two channels will be devoted to public and educational use--IF we are ready to use them. There must be ground systems ready to utilize their signals, to store and relay them.

Rural America is increasingly the concern of the federal establishment and of major foundations. The Ninetieth Congress directed OEO to establish an Office of Rural Affairs for the precise purposes of enriching rural life and creating opportunities for escape from rural poverty. But to do this, **all** rural life and opportunity must be enhanced. One cannot plan simply to educate the poor; the whole system has to be improved for benefits to all. In the same way, the poor, but not the poor alone, must be given access to educational and public broadcasting. **Public radio must advance into the countryside with the goal of total coverage.**

How?

The federal establishment has many agencies committed to rural opportunity. In the Department of Agriculture, Resource Conservation and Development (RC&D) sponsors rural community development, as does the Rural Community Development Service. The Federal Extension Service, cooperating with land-grant colleges and county agents across the country, maintains a Division of Community Resource Development. The Rural Electrification Administration (REA) fosters electric and telephone cooperatives. The Farmers Cooperative Service (FCS) and the Farmers Home Administration (FHA) foster housing and general cooperatives of all types. HUD, under Section 701 of the Housing Act, fosters conservation--including information systems. In HEW, rural health is supported by PHS by training and information facilities; the Office of Education has concern for rural schools--and information systems. And my own agency, the Rural Affairs Office of OEO, is moving to establish programs of collaboration with land-grant colleges and national educational broadcasting organizations.

It can be done.

We should move to enlist the Corporation for Public Broadcasting, the NAEB, the JCET, and foundations and communications industries to plan and promote local radio cooperative arrangements (some legislative changes would be needed), state-wide radio networks, and land-grant college leadership in bringing the full gamut of **public and educational** communications to **all** the people. We should be in touch with the White House Office on Telecommunications Policy, with COMSAT, with the Ford Foundation, with the Federal Communications Commission. We should invite the cooperation of wire and cable industries.

We should not rest until rural America has joined the national conversation.

COMMISSION V

Telecommunications and Rural America

GENERAL DISCUSSION

Frank Cyr: In the rural areas you're dealing with use by small groups. We started out with mass transportation in the railroads, where we have two rails and a split-second schedule and a series of specialized units that were hooked together and put on the tracks together, and that's the best form we've ever found to take masses of people from New York to Albany. But there are only twenty stops. Branch lines, at the same time, were no good at all, and never have been. There is nothing wrong with the communities, but a railroad system with that pattern of organizing transportation is of no value in a rural area, and never can be. Whatever you do in telecommunications, you're taking a railroad line down the road, and it can only stop at a few places.

Then Henry Ford came along and developed a small integrated vehicle that was self-propelled. It was driven by a passenger, not by a crew. This was right for rural areas. Now we've got to get to this automobile pattern of operations in rural communications somehow.

It seems to me that development in the sense that we're trying to use it is not limited to the development of gadgetry. We're talking about trying out educational strategy and structural strategy, perhaps even administration procedures. Development to me means being on the forefront of those areas where we are encountering the facts of life. Namely, our policies are derived from tradition, and they are no longer suitable for getting the job done.

And another point I'd like to make in general and also in particular addressed to Dr. Wilbur Schramm because of his celebrated studies in ETV is that it's just clearly the wrong thing to study, and it is possible that the criteria were all wrong. The reason why people are loath to move into development on the faculty level is that the studies demonstrate there is "no significant difference." And if there is no hope for doing a job any better, why should we use an elaborate gadget when we have a perfectly functioning one?

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I think you have to accept the fact that there is nothing better than a first-rate teacher in a first-rate university or school. On the other hand, think of all the schools that are not giving such an education, and think of all the new students they're going to enroll. People who are not getting even an adequate education can now be provided a first-rate education through TV, but I would strongly suggest that a first-rate university would be the last place that will adopt such a system. You have to go to places where there's need, where there's crisis, where people are not getting a service at all.

We assume that universities don't want to use standard data processing techniques because they want to develop experimental programs. Most universities don't want to become a service institution. We predicated our model on the basis that, if we produced quality software and a commercial company could come in and see that it works and see that it works effectively, they would in turn take this model and reproduce it elsewhere. A university is primarily concerned with its own immediate geographic area.

These are developmental problems, developmental concepts, that must be attended to in order to use large-scale technology because it is expensive. It can't be done piecemeal because it becomes so exorbitant that it's not worth the price.

We still spend about ninety percent of our lecture time transferring information which could easily be done by printed matter, through compressed speech, and through films. Now, if we can sort the content and handle information transmission in a mechanical manner, it would free us to do the other things we don't have time to do now. I know many computer courses where they spend time learning how to program in a certain language, and then, when they get into more interesting subjects with which exciting programs can be made, all the time is used up so there is none remaining to spend on the best possibilities.

For almost any legislation which deals with education there is some basis for it in existing legislation. The problem is where the government programs provide the training they don't provide the equipment, and where they provide the equipment, it is designated for some specialized purpose for students who aren't there to utilize the equipment. So, I ask you, how much money do you need to get in operation a program which would affect a large proportion of the people of our country? We're spending four-fifths of a billion dollars now on educational media. If that amount of money could be reprogramed,

what better programs could be worked out? The public broadcasting people are talking only about five million dollars.

From the floor: You point out that media can function better than the lecture method in information transmission. This we all know, but the reason that media fail is that no one has bothered to retrain the faculty to do something besides information transmission. These two activities must go on together simultaneously; we must continue to develop telecommunications in our technology, but at the same time we must also develop the human resources that we have, and we haven't even begun to do this. What does it profit you if you have the most elaborate computer programing, the most elaborate bibliography in a memory bank, and adequate television resources, but the man who is managing the system is an incompetent?

What happens when a boring professor talks to two students in the class and ignores the other twenty-eight? Mechanization could provide fifteen alternatives to individualize that instruction.

We are a talking society, and talking is one means of communication. I don't think we should discard the lecture. What needs to be done is to bring modern technology to bear on teacher-training practices so that the education that a student gets is itself mediated and technologized and there comes about an understanding of and a familiarity with this whole process. One of the most conservative elements on any campus is probably the teachers' college, and that's why the teachers coming out of these colleges are such conservative types.

I'd like to see something along the idea of the land-grant act; I think it's going to take something as magnificant as that act which set aside the resources of the nation for land-grant institutions to develop our education.

James Miles: I would like to state a couple of basic principles that I find very helpful: First, whatever system is designed, it must be infinitely flexible and totally compatible. Second, the ultimate goal to strive for is to make information, learning, and education available to everyone wherever they are whenever they want it.

C. Ray Carpenter: What you say, Jim, takes us to the extra-school environment. We've got to deal with this problem in terms of processes and operation instead of people. I find the dichotomy between the rural and the urban to be false. I meet the same people on the west side of Chicago as I met in the Piedmont section of North Carolina, at different times. What we ought to do is to recommend specified kinds of studies not of static populations, because populations aren't static, but of the flow of populations. Where do intersections occur between population currents and information? There is another kind of system and it is the information flow system. If we think of that, what exposure possibilities exist when and in what spaces? So you have here two flow systems, population flow systems and information flow systems, and the interactions of the two. That's the business of education. This is our problem in Appalachia, and Philadelphia, and Chicago. But the intersection has to be actualized, and this is the part that is most difficult. You get the message through the air, but how do you get it through the ears, through the eyes, through the brain, and into some kind of an effective action application? People whom we should involve turn off educational radio, television, any other educational telecommunication because of the negative signs. And the signs are all there. The signal that it's educational says to too many, "Get out of there." Studies have shown this on a widespread basis, because the prestige of educational programing isn't high enough, the quality is not good enough to compete. The quality in advertising TV is increasing enormously, and this creates alternatives which are selected in preference to the educational alternatives.

Frank Cyr: I agree with everything you said and I go further. There are a few minor differences of size and age and color, but the fact is there are a few permanent things that you have to recognize if you're going to accomplish anything in an action program at any time. In the rural areas we have to face the fact that it's small-group use that we need; it's not individual instruction, primarily. We have to make certain modifications in order to get small-group use in these small communities.

C. Ray Carpenter: We educators are transmitting to our engineering colleagues something that's very expensive and maybe impractical; it is the urgency that learning be individualized. The engineers get to worrying about how many channels are needed to provide instruction for each individual. Individualization of instruction has been adopted to the point where it is becoming a religion——a very expensive myth.

Frank Cyr: We now have a system that is capable of serving twenty schools over a 100-mile area. We can give any course or televise any professor that is available for use for preschool or drop-out programs and by elementary schools, community colleges or four-year colleges; we can give a graduate course in nuclear physics with professors from Stanford University who can be presented on the air through television and then can discuss problems with the people in the broadcast area through our telephone circuits. We can supplement the instruction with correspondence materials, like those of the University of Wisconsin.

We have a room assigned to us in each of these twenty schools. We can have classes for twenty, and these students can get all of the material that they get now through the other media. They don't have to be in one building or one room. I think what we need is to make it possible to teach people in small groups or individually and to do this economically. We could pay these professors at the same rates that they are paid, but we wouldn't have them on tenure. As soon as the course is over, we go to another university or college to get the teacher that we need for our next course. We can give all the kinds of courses people want, but we don't have a reserve faculty waiting for assignments.

From the floor: Who determines your program?

Frank Cyr: It's a basic fact that the people do. There is nobody upstairs on some cloud deciding for all of us what we ought to think. We need some of that because we all need to have a common base of knowledge and subjects to talk about, but we need also to communicate locally. We do this in our system, among the rural people, so there is local communication as well as mass communication.

Wally Briscoe: Ultimately we will be using on a widespread basis amplifiers that have more than the five- or twelve-channel capacity of the typical system in operation today. As you may know, there are some twenty channel systems being built now, with channels up to forty in number on the drawing board.

From the floor: Then you can provide education for three- and four-year olds without bringing them together into the same room.

Harold E. Wigren: I think, too, that the problem is what Charles Frankel mentioned this morning. When you deal with three- and four-year-olds continually, just beaming messages at them is not enough. Something more than this must be done, recognizing that learning is an active process and this one-way viewing would get dangerously close to passivity.

James D. Templeton: "Rural" is more than the negative, or opposite, of "urban" or "metropolitan." "Rural" is a distinct and positive form of social organization. This is recognized in the existence of **rural sociology** as a distinct profession within the general discipline. Understanding this distinction is the necessary prerequisite to formulating policies and strategies for an attack on rural poverty.

The first difference is that in rural areas fewer people occupy larger spaces. The population of the sixteen counties in eastern Montana, for instance, averages out to little more than two people per square mile. This immediately introduces factors of time and distance that directly affect the delivery of services of all kinds: education, health, shopping, libraries, employment, law enforcement, religion. The cumulative effect has been defined by Professor Carl Kraenzel, foremost rural sociologist of the Great Plains, as "the social cost of space."

Secondly, centralization of services is important in cities; OEO's health thrust there has been to create "one-stop" health centers. In rural areas, this is contraindicated; instead, each of the decentralized service stations must be **multipurpose**. The county courthouse has office space for the extension agent, the public health nurse, the mental health-retardation-alcoholism-comprehensive health communications agent, as well as the sheriff, the judge, and the commissioners.

This, in turn, means a third consideration, that the political presence of the county is more involved and more visible than is true in the highly specialized metropolis. The CAA relies on the membership and the support of county commissioners who have the power to budget their participation——or to block any action at all.

It means, fourthly, that all organizations and plans for improving living conditions and economic status interlock with each other, and with the prospects for economic viability and advancement of the area as a whole. Hygiene and sanitation, preventive medicine and acute, long-term treatment, schooling and

vocational training and jobs, communications and transportation, along with other societal arrangements, are mutual requirements and have to be developed along a single front of planning and action.

Fifth, the poor in rural areas are not visible as a segregated host within a geographic neighborhood. They dwell singly, as families, on farms or the edges of the service towns, interspersed among the self-sufficient and the well-to-do. Conversely, however, the well-off in income are adversely affected by the general paucity of services: poor schools deprive their children, too; poor hospitals and medical services leave them medically poor along with their poverty neighbors––except as they can fly out to the larger centers.

Urban mentality and presuppositions have stood squarely in the way of our developing a strategy appropriate to the countryside. The ghetto Community Action Program, the Headstart and Upward Bound, the Neighborhood Youth Corps, all presuppose an aggregated population with nearby services available. There are few "multicity" CAPs.

The rural countryside requires that we think in terms of economic areas, which usually means multicounty organization. It requires that we bring both **communications** and **transportation** together in our strategy. It calls for the gradual education of the country people into acceptance of urban-type standards for their own social functioning, within the context of spatial separateness. It calls for less emphasis on ear-marked programs, and more on collaborative planning and action with USDA, TAPs, and FHA cooperative programs, and Outreach; and more closely coordinated efforts with PHS, HUD, EDA, RC&D, CEP, CAMPS.

In a Montana village of fifty families, there is no doctor, no nurse; the nearest hospital is forty miles away. Children are bussed to the consolidated school. Shopping is by mail, or in a town twenty miles distant. Rain and snow bring isolation.

Yet country people have a tradition of mutual self-help. It is this tradition––the barn-raising, the box supper, the quilting bee–that the Office of Economic Opportunity must build on.

We can help the rural poor. But to do it, we must involve the nonpoor, must aim at raising the entire gamut of social resources and services. And we must do it in the closest collaboration with the federal

departments that know the countryside, the migrants, the Indians. We must continue to raise the levels of understanding of the urban-oriented agencies such as the Department of Labor and Housing and Urban Development. And we must, through a consistent emphasis on rural affairs, help our own agency to reorient its map, its maneuvers, its total strategy, for the attack on **rural** poverty.

COMMISSION V

Telecommunications and Rural America

REPORT AND RECOMMENDATIONS

Recognizing that the people of rural America need access to high-quality education, this commission recommends, therefore, that the JCET work with other educational and technical organizations to establish one-way and, for some applications, two-way capability demonstration programs of mass communications, including public and educational radio and television to rural areas, looking to the use of the foreseeable most economical means, including satellite relays and distribution systems, whether to community receivers or cable systems or direct to user. Equipping rural areas with ground stations and systems should have high priority in satellite planning and development. The commission therefore requests the JCET to arrange a series of experiments and demonstrations in depth of multimedia educational systems suitable to rural areas and adaptable to ultimate satellite application.

It is fully realized by the commission that teaching techniques, educational methods and content, and administrative procedures will need to be reexamined in the light of new technological methods of communications made possible by computer information systems and domestic satellite systems in order that the optimum benefit of these may accrue to the entire educational community. A continuing program of evaluation should be pursued with the aim of developing the most beneficial and effective educational programs or systems for all levels and kinds of education. To make this possible, it is of supreme importance that really adequate financial arrangements be made to ensure the excellence of programing.

JCET should work with the FCC to obtain allocations in AM, FM, and TV that can serve remote and sparsely populated areas, to obtain adoption of rules favorable to the use of TV and satellite translators in unique application to rural areas; and to develop rules permitting semicommercial cooperative radio and other telecommunications means of meeting priority needs of the rural population.

Studies should be made of population flow between country and city, in representative regional areas, and of the information flow where these streams converge or intersect, each bringing its own

expectations as to values, life styles, and needed intelligence. Suggested sources of such studies include the U. S. Office of Education, the Bureau of the Census, the U. S. Department of Agriculture, and the U. S. Department of Housing and Urban Development.

Urgent Action Regarding FCC Dockets 18262 and 18294

If we assume that there is a need for public and educational television via domestic satellite in the United States, action must be taken now to respond to FCC Dockets 18262 and 18294 on the following basis:

These two dockets propose to allocate the upper end of the UHF band (Channels 70 to 83) to land-mobile rather than television use. These frequencies are now estimated to be the optimum cost point for operating satellite TV systems over relatively large areas. In the light of this, FCC action to remove this portion of the spectrum from TV use at this time is premature and potentially highly restrictive to the future development of education in the United States.

It is urgent that JCET, as spokesman for the educational community, requests that at least a portion of this spectrum be specifically allocated to educational TV.

Urgent Action Regarding ATS–G Experiment

Regarding the use of the NASA ATS program, in particular the ATS–F/G, JCET, as spokesman for the educational community, should take steps now to define an experimental package for the ATS–G flight program.

ATS–F will be used as a broadcast satellite to reach approximately 5,000 low-cost receivers (approximately ten-foot antenna and UHF FM to AM converter) in India. Through this experiment, the Indians will learn more about how to use such a capability to meet their community educational needs. This is obviously an excellent peaceful application of space and a desirable international act which must be endorsed. Furthermore, this should serve as an incentive to U. S. educators to take steps to get this type of experimentation applied in the United States, utilizing the ATS–G.

REPORT

Conference Commission V, Rural America Follow-Up Meeting. Washington, D. C., February 6–7, 1969:

I. Thursday, February 6, 2:00 to 9:00 p.m.

Attendance:

John D. Sullivan, Commission chairman; assistant executive secretary for Communications and Public Relations, NEA

Patrick Bergin, General Dynamics/Convair

William Bost, assistant director, Appalachia Regional Educational Laboratory

Frank W. Cyr, director, Rural Supplementary Education Center, Stamford, New York

Robert M. Isenberg, associate secretary, American Association of School Administrators

Wesley Meierhenry, assistant dean, Teachers College, Advanced Professional Division, University of Nebraska

James Miles, director of Television and Radio, Purdue University

Frank W. Norwood, executive secretary, JCET

John Walker Powell, Rural Affairs, Office of Economic Opportunity

Emil Steinhardt, professor of engineering, West Virginia University

Louis R. Tamberlyn, Division of Field Services (Rural Education), National Education Association

Harold E. Wigren, president, Joint Council on Educational Telecommunications

*Member of the commission but not attending:

Vernon Bronson, consultant, Research and Development, National Association of Educational Broadcasters

Note: Resolution amended:

Mr. Cyr proposed, without dissent, to amend Commission V's Athens Conference resolution No. 1 to read as follows:

> "Be it resolved that rural America needs access to high-quality education. This requires organization, operation, and technological equipment designed for effective use by small groups and for reaching small communities in sparsely populated areas."

And in line four, "demonstration programs of mass communications," to be changed to read "mass and local communications."

General Discussion

Mr. Sullivan, as chairman, recalled the Athens Conference (which not all had attended), and said that the JCET had chosen the Commission on Rural America for the first follow-up meeting because its recommendations had been the most closely focused on action.

Mr. Powell summarized the characteristics of "rural" as these had been discussed. He said the OEO has begun a series of meetings with some twenty federal departments and sub-agencies, congressional committees, and national rural and farm organizations, simply to define the word "rural"——thus far, without success. He suggested that, from the urban point of view, "to be rural is to be disadvantaged": fewer people are surrounded by more space, adding real increments of time and cost to their getting to service centers, or getting services to come to them. Rural services, especially health, education, and information, are notoriously poorer. Rural people rely on self-help and group action, which are not accessible to mass mechanisms for transportation, hospitalization, markets, etc. Their service centers must be decentralized; and each has to be multipurpose: the general practitioner, not the specialist, whether in medicine, education, mechanics, or whatever. Social services must interlock with each other. He suggested that these same characteristics could be combined into an affirmative statement of rural values. Frank Cyr

added that rural society was marked by lack of specialization, and by the necessity to train more people where they are, without pulling them into town.

Mr. Cyr then described the resources employed in the Rural Supplementary Education Center program in six south-central New York State counties. They include the following:

> distribution, on wheels, of materials and demonstration equipment (slides, films and filmstrips, print, displays, kits, etc.) twice a week to the schools in twenty school districts;
>
> traveling art exhibits (paintings, sculpture, prints, etc.);
>
> videotapes from three ETV stations, plus ITV to schools, and public TV to homes and communities (including tie-ins with nine CATV systems);
>
> Tele-learning multigroup phone conferences with remote individuals in leading positions in literature, the arts, government, science, exploration, or with children of other cultures and representatives of foreign countries;
>
> TV camera and tape unit used in counseling training, group therapy, etc.

The TV distribution relies on translators, approved by the FCC for twelve limited-range channels in UHF and VHF; and on the innovative use of a fuel cell to power one of these.

The system serves some 10,000 pupils, plus homes and towns, in an area whose largest town (aside from Cooperstown) boasts 1,200 residents; and that includes mountain regions and remote valleys. The principle is that rural people "must be furnished the same kind, amount, and quality of culture" as urban people; and the people must control it themselves, through their school districts and interdistrict councils.

Mr. Bost, assistant director of the Appalachia Regional Educational Laboratory, described the AEL's current experiment in eight West Virginia counties, bringing preschool educational experiences to three-, four-, and five-year-olds in remote rural homes. The program built around broadcast TV programs includes visits by paraprofessionals to the children's homes and parents;

daily TV presentations involving action, cognition, concept development, through directed activity; and periodic visits by a "traveling schoolroom" that can accommodate several children with a teacher for socialization of the learning experience. Only one of these is active at present. Extensive multilevel evaluations are built into the experiment; the present outlook is quite affirmative.

Discussion of the reach and per-pupil cost of these programs, which is moderate despite the innovation and development aspects, led to extended discussion of the relative costs of wire, cable, broadcast, and satellite distribution. Mr. Miles proposed that the REA form of organization could be applied to cable, too. Mr. Meierhenry said the REA's greatest contribution had been to force the phone and power companies into giving service they had previously denied. Mr. Wigren proposed a "Public Telecommunications Corporation" on the model of the CPB.

Dinner, in a private room at the Cosmos Club (thanks to Mr. Cyr) produced extended discussion of the educational possibilities of satellites; Mr. Bergin and Mr. Steinhardt served as expert consultants. Questions included cable versus satellite distribution; Mr. Bergin pointed out that California's extensive cable and microwave system was frequently put out of commission by natural catastrophes. The capabilities of the proposed NASA ATS–G satellite (1973) versus the giant Saturn-boosted satellites of the 1980's were compared. (General Dynamics/Convair has a NASA contract to explore uses and users of the latter.)

Innovative projects suggested included Indian reservations, migrant populations.

II. Friday, February 7, 9:00 to 12:00 a.m.

(Miles and Sullivan were absent; Cyr and Meierhenry left early.)

The Friday session was briskly oriented toward decisions on actions that could be taken under the leadership of the JCET and with the help of its constituents.

Mr. Powell, as acting chairman, suggested three guiding principles in any experiment with satellite education:

It should dramatize and demonstrate communications problems **characteristic of the rural situation**, and display proposed solutions;

It should dramatize and demonstrate **versatile characteristics of the satellite itself** and display proposed applications;

It should dramatize and demonstrate the uses of **new terminal hardware**—facsimile, remote xerography, data transmission, remote diagnosis by electronic multiphasic screening, computer-access learning, two-way teleconference, etc., in training uses and in professional use.

Discussion began on costs: perhaps $10,000. for an "up-link" transmitter to a satellite; $150 to $250 for a ground receiver-converter (with the ATS–G). Mr. Isenberg cited a regional telephone-computer linkage and wondered if the satellite could provide a nationwide digital and voice network. Comparison with the use of long lines indicated the satellite was at least as reliable, and cheaper over long distances (e.g., the distance from Washington to Baltimore is forty miles plus 22,000 miles up and down again). Suggestions included linkage of all Job Corps centers; a weekly broadcast to the entire NEA.

Discussion moved to wide versus narrow coverage: given the satellite, why not reach the entire country? One answer was, the wider the coverage the weaker the signal; one-third to one-sixth of the country is probably optimal. But the covered band could move, from one time zone to the next, from west to east, on different days or for six-month periods allowing multiple experiments. Or should the entire experiment be focused on a single area, such as Appalachia, with multiple elements? The Indian and migrant examples were suggested again; Mr. Cyr objected that these are very special, not "typical," rural situations.

Mr. Isenberg proposed that the experiment include a variety of technologies; perhaps six components, each worked out and controlled by a different team. But it would be necessary to know the precise capabilities and limitations each team had to work with. Mr. Powell suggested the JCET, under Mr. Norwood's direction, prepare a "catalogue" of hardware capabilities and a glossary of technical terms.

Mr. Cyr pointed out that the crucial evaluations would be not by the technology used but by the people served; each team could use several kinds of communication.

Mr. Norwood observed that getting ready for an experiment would be a major effort in itself: How many groups should be consulted? How long would it take to explain that the satellite is not just a great big MPATI in the sky? Mr. Powell suggested that ground capability for storage, retrieval, and retransmission would be needed. Mr. Bergin said perhaps this is true for ATS–G, but not for later ones.

There was further discussion of the satellite's advantage over a network of ground communications; one answer was the elimination of multiple new broadcasting stations. This led to comments that both commercial and educational TV people felt threatened by the satellite competition, and AT&T line charges would definitely be hurt (for which no one seemed unduly sorry). Other problems were also cited: the lack of international frequency agreements, which are being worked on; the opposition of regions, states, and even school districts to having their programs originate elsewhere; the possibility that other countries could mount satellites to blanket the United States, over which we would have no control. Broadcasting people are opposed even to conferring with the cable people.

Mr. Meierhenry brought the talk back to consultation with possible user groups: This would take time and money; could the USOE be approached for funds for this? Mr. Isenberg thought two steps should precede: precise information on satellite capabilities (e.g., overnight data exchange); and a screening of possible prime audiences. Then conferences could be started.

Mr. Bergin summarized the NASA situation: the ATS–G, latest in a series of small automated unmanned communications satellites, has Apollo boosters ready to use, but its equipment and use will not be determined for some time. We have until April or May to request its use for an educational-professional experiment. The emphasis in this series is on technological applications. We have to identify the cooperative users, their commitment of funds, the groups that will continue to help, the nature of the experiments, the interfaces among experimenters. (Convair could help with specifications. GE is doing the screening; Mr. Hesselbacher was at Athens,

and could help.) The 1975 satellite will be of up to 60,000 pounds payload; men can be sent up to make changes while it is in orbit. Life expectancy of present satellites is estimated at a minimum of five years. The NASA experiment will be of one year's duration, however. Since the ATS is small, the experiment can be designed to use the whole equipment.

Mr. Wigren asked for the group's recommendations. Mr. Powell suggested two subcommittees, one on technology and one on possible user groups. Mr. Cyr reminded the group that there were **two** recommendations from Athens: the satellite experiment, **and** a multiple-communications in-depth demonstration in a rural area. (Other Athens recommendations were not taken up here.) He believed the commission still wants both. Mr. Meierhenry proposed telling the JCET board that the group wants satellite space but needs to clarify the guidelines and criteria so as to identify user groups under these. For example, Mr. Pollen (USOE) might be interested in our exploration of professional education--particularly for school administrators.

Mr. Bergin explained the NLM's bio-medical network plan, which comes under HEW's Networks for Knowledge Act. This program will encompass all medical interests but not education. JCET could still offer to cooperate with them in exploring health training possibilities--and might find an advantage in doing so. Mr. Bergin also offered to furnish the group with information on ATS-G characteristics and the NLM proposal.

Mr. Norwood said we already know that the ATS-G will have three TV channels, that one channel could be converted to 200 voice channels, and that receiver-converters cost up to $250. In reference to Mr. Isenberg's question whether you could broadcast to Navajo hogans or only to schools, he said it could not go to the hogans, but to schools, or to the head-ends of various networks. Mr. Bergin recommended telling Greg Andrus, at NASA, **now** that we are preparing to make a proposal **later**.

Mr. Steinhardt presented two statements: (1) The United States will soon have the technical capability for a nationwide ETV system via satellite. The system will have unlimited potential but may present problems in that satellites are best used for wide-area service while educational needs are usually of a local or individual nature. As there may be many uses, and the

optimal system is as yet undetermined, JCET should propose the initiation of a pilot system to explore the potential and the limits of such uses, employing the ATS–G. (2) It may be wise to try the experiment within a limited area which would both ease the satellite requirements and also limit the number of ground receivers; and it would make use of multiple elements––preschool, in-school, adult, and training––and measure the total impact on the specific area. It would offer a pocket model for applications that might later be national or international.

Mr. Isenberg proposed a management committee to see that steps are taken in an orderly manner: to make assignments to this group or an enlarged one, annotate technical possibilities, make a list of projects, set guidelines and priorities, and involve other groups. Mr. Norwood said the "rural" group should be enlarged to include urban, professional, regional, and other interests. Since NASA was not offering money for project planning on the ATS–G, funds would have to be sought––from USOE or elsewhere.

Mr. Wigren raised the question of how can you keep educators interested for four years when they're used to looking ahead only weeks at a time? He suggested that including Mr. Cyr's proposal for a multimedia demonstration in one area might do it.

Mr. Bergin suggested that the group might come up with a **total** experimental package, of which the satellite application would be only one part, and which would include the AREL experiment and Mr. Cyr's program, and would move them around, gather new data, then use the satellite to extend them to Indians or others––but only as an **added** component. Mr. Wigren pointed out that the present AEL program was only one part of a total plan. Mr. Isenberg added that if we waited four years for the satellite, we wouldn't be ready to use it; there must be continuous experimentation and demonstration in between: "There's really too much to do between now and then." Mr. Bergin said we could lay out the design now, and notify Andrus, and then start work on the components.

The discussion came to final focus with the observations that we have electronic media ready to use, and some progress in using them; that, as the space program tested out one process after another and put them together into more and more sophisticated programs, we could do the

same. The interim experiments should be based on telecommunications methods; and methods of **evaluation** should be carefully worked out and tested. Design the components one by one, define objectives step by step: for the first time, a systems engineering approach to the creation of educational "software."

Mr. Bergin offered a series of steps: (1) review, with JCET and NEA components, the list of projects; (2) select candidate experimenters; (3) confer with them on definition of the experiments; (4) review the capabilities of the ATS–G with regard to on-board equipment, flexibility of performance capabilities, ground-to-satellite-to-ground requirements and costs, etc.; (5) submit the experimental package design to NASA (Form 1347, by April 15); (6) negotiate with USOE and other sources on interim planning funding; (7) implement component experiments (such as AEL, N. Y. Supplementary Education, Northern New England, an urban area, Indians).

Mr. Wigren said the JCET board would not go for an **all**-rural package; it should include urban, and a variety of regions that could make their own decisions on being included. It was agreed also that the Coleman (U. of Texas at El Paso) program of reading readiness through cartoons and beginning word lists lent itself perfectly to widespread application and testing; that locally developed programs should be offered for testing and self-evaluation by other localities; and that the principle of local control, as well as local evaluation, should be observed so as to involve as many as possible citizen participants in order to safeguard the continuation of the programs that were created for the satellite.

It was observed that the proposed method of organizing educators for a systematic development of a long-term experiment was **itself** the greatest experiment of all.

Respectfully submitted,

John Walker Powell
February 11, 1969

APPENDIX

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	American Association of School Administrators	William Ellena
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*	Great Plains National Instructional Television Library	Paul Schupbach
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NB: Two organizations, which were JCET members at the time of the conference, have resigned, as of February 1969:

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TO: SPACE SCIENCE AND APPLICATION DIVISION,

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Date: June 13, 1969

A PROPOSAL FOR EXPERIMENTAL USE OF ATS

By: CORPORATION FOR PUBLIC BROADCASTING

FORD FOUNDATION

NATIONAL ASSOCIATION OF EDUCATIONAL BROADCASTERS

NATIONAL EDUCATIONAL TELEVISION

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

I. INTRODUCTION

The Corporation for Public Broadcasting appreciates the opportunity provided by the National Aeronautics and Space Administration to comment on the possible experimental use of the ATS I and III satellites now in synchronous orbit and the ATS E satellite which is scheduled to be launched in August of this year.

We appear today representing a wide range of views in the public and educational broadcasting community whose interest in the use of satellites dates back to 1962 and the subsequent Ford Foundation proposal of August 1966. The proposals advanced represent a consensus of views of the Corporation for Public Broadcasting, the Ford Foundation, National Association of Educational Broadcasters, National Educational Television, and Joint Council on Educational Telecommunications. These groups all share a joint resolve and a common excitement about the unique opportunity offered by the potential use of these satellites.

While public broadcasting is aware of the significance of this meeting for itself, the use of satellites for broadcasting in general and educational communication has a much wider impact. The ultimate beneficiaries will be all broadcasters and the American public.

The ATS experiments will enable the broadcasting industry and the public to become familiar with this aspect of the satellite technology. At present, neither the national viewing and listening audience nor the multitude of communities of interest in the public and commercial broadcasting endeavors has accumulated any experience with domestic satellite relaying.

The experiments proposed by the corporation will establish a body of knowledge relating to the operation and control of a domestic satellite system complementary to the technical information that has been gathered by NASA over the past several years. In addition, the corporation hopes to provide a vehicle through which the inventive capacities of others can explore and evaluate the particular capabilities of satellite relaying in domestic applications.

The use of ATS satellites as set forth herein will provide the American public with a daily demonstration of the application of space technology. While there is nothing more dramatic than placing a man on the moon or taking pictures of Mars, it is through the ability to demonstrate that this technology

will affect everyday life that we can assure those who question the direction and expense of the space program. The fact that unused technical capacity of an already existing satellite that has outlived its original purpose can be utilized for broader public interests is visible proof of the daily application of space technology and to what extent space dollars can be applied for the general benefit of society.

Public broadcasting has well defined needs and interests that form the basis of this proposal. But the horizons and objectives of the NASA experiment should be expansive in nature, and we hope for the fullest cooperation among all the interested parties. The corporation and the public broadcasting community hope that any experiment will encompass the broad needs of our industry, and we call upon fellow broadcasters to join with us to explore the ultimate potential of this technological advancement.

This is a unique and troublesome time in this country's history. The decay of some of our most basic social institutions seems to be developing as fast as scientific and educational attainment. We feel that the proposals set forth herein afford the scientific and educational communities the unusual opportunity to join together in a dramatic demonstration of technical and social progress that could afford new hope to a troubled society.

II. PROPOSAL

We propose to use satellites to accomplish four related experiments and demonstrations:

A. Transcontinental Interconnection

B. Radio Network

C. Satellite Cities Demonstration

D. Remote Production Capability

Transcontinental Interconnection

Our initial priority is to demonstrate that transcontinental distribution is feasible and a major step forward in the growth of noncommercial broadcasting. We propose that a relay link be inaugurated between the east and west coasts using ATS III as the distribution mechanism. Television programs would be

delivered through conventional terrestrial microwave links to either the NASA earth terminal at Rosman, North Carolina, or Mojave, California, depending on the point of origination, and then relayed by the satellite to the companion terminal at the opposite coast for distribution or other use.

Since January 1969, public broadcasting has been utilizing for two hours a day, five days a week an interconnected distribution system for national programing through traditional terrestrial facilities. This system is expensive in the context of the resources available and extensive new facilities will be required to make it function effectively. Efforts to establish a more permanent system are underway at present, but the current estimates of the cost of such a system are still far beyond the means of the public broadcasting community.

Distribution of programs by satellite has been part of the public broadcasting community orientation since the first Ford Foundation proposal in 1966. The use of a satellite distribution system may prove to be the only practical method available to public broadcasting for programs to be made available to the public on the same basis as commercial television. The use of the ATS satellite for the transcontinental demonstration will provide the data to determine that this is a practical and efficient distribution system and would facilitate and encourage the flow of programs between the east and west coasts. It will give public broadcasting a unique opportunity to analyze the daily operational and technical problems that are involved with satellite distribution. Such an experiment will provide the data upon which the distribution options available to public broadcasting can be analyzed in terms of our financial and technical planning.

Since virtually all of the requisite technical facilities are already in existence, this experiment can be operational as soon as NASA approves the use of the satellites and the ground stations.

Radio Network

One of the most dramatic and promising proposed experiments is to give noncommercial radio the opportunity of establishing a national interconnected network.

At present, noncommercial radio does not have access to a national network because of a lack of funds. However, the potential of existing satellite communication facilities suggests that such interconnection could be accomplished rapidly and without excessive capital or operating costs. By utilizing

the VHF capability of the ATS satellite, we can establish an inexpensive receiving facility at individual noncommercial radio stations throughout the United States. In addition, at selected points transmitting stations could be constructed and then utilized to transmit radio programs throughout the noncommercial radio system to demonstrate the need and the practicality of a noncommercial radio network in the United States as outlined in the Public Broadcasting Act of 1967.

As an adjunct to the radio network, we plan to explore the possibility of utilizing the satellite to provide noncommercial educational radio programs to Alaska, Hawaii, and Puerto Rico. If this proves feasible and as technology develops, we hope to expand this demonstration to include the transmission of television programs to these areas.

Satellite Cities Demonstration

As a natural extension of the transcontinental experiment, the corporation proposes a demonstration of both the distribution and programing capabilities of satellite technology.

We propose to designate a group of cities within the United States as satellite demonstration cities. These cities would receive programs directly from the satellite either as part of a network origination or a delay pattern to demonstrate the ultimate distribution capability of a satellite system. Furthermore, some of the cities will be utilized as production centers with the capability of transmitting by satellite directly to the other satellite cities. In this way, program material produced by the local production centers will be made available to all satellite cities. While whole programs produced at the various centers will be distributed in this fashion, it is also possible to piece portions of programs together by utilizing the satellite as a switching center.

We contemplate that six cities will participate in this demonstration. The exact number of cities that will have transmitting capability will be based on funds available and estimates by manufacturers as to the construction costs of transmitting and receiving terminals. We hope that the test could be operational as soon as construction of the ground facilities are completed.

In our view, a meaningful test of this nature should also address the needs of the academic, educational, and disadvantaged communities in the various cities. While the selection of the satellite cities

will primarily be based upon geographic location and production capability, we would actively seek the participation of universities, public educational authorities, and organizations concerned with the problems of disadvantaged communities in the planning and selecting process.

For example, the possibility of establishing receiving capacity on an Indian reservation as suggested by the Report of the President's Interdepartmental Task Force on Communications Policy would be explored. In essence, the opportunity to use the ground facilities for the distribution of instructional and cultural programs for specialized audiences could offer dramatic evidence that satellites have the potential to make a profound impact on the educational and social problems of the nation.

Remote Production Capability

This demonstration would explore and evaluate the use of mobile transmitting stations which can be transported to remote and relatively inaccessible areas on short notice to pick up and relay events which are not now available to the national audience.

Present national communication facilities cannot transmit from remote areas efficiently and at low cost. In order to broadcast events that occur in such areas, significant lead time is required to construct new transmission facilities at a cost that often makes it unreasonable to cover the event.

Existing technology would enable us to place a portable transmitter on a vehicle accompanied by a television mobile unit and then transmit to the satellite. In this way, the capacity of all broadcasters to react to dynamic and unpredictable situations would be significantly enhanced.

We recognize that use of mobile transmitting facilities must include careful consideration of the potential for interference to existing terrestrial microwave systems. However, the corporation believes the need for this type of service is sufficiently urgent and the promise sufficiently bright that the experiment must be undertaken. Since the problem has been most identified in the urban areas of the country, we propose initially to conduct the experiment in distant areas that normally are not heavily penetrated by conventional microwave facilities and, therefore, less likely to raise the interference issue. It is precisely these areas that broadcasters have difficulty reaching with television facilities. Such a test will contribute a great deal toward determining the technical limits of the use of mobile transmitters.

III. CONCLUSION

The availability of the ATS satellite for experimental purposes affords broadcasting, and in particular public broadcasting, a unique opportunity to expand the horizons of the medium. In addition, it provides a dramatic demonstration of new scientific and social progress.

The parties to this submission, and in particular the corporation and the Ford Foundation, are prepared to offer manpower, technical, and financial aid to support the experiments outlined in this proposal.

We suggest the following course of action:

1. The Corporation for Public Broadcasting and NASA enter into an agreement which would allow the use of the ATS III satellite for the transcontinental demonstration set forth in (I). We propose September 1, 1969, as the operational date for this demonstration.

2. The Corporation, NASA, and the FCC enter into an agreement which would allow the use of remote equipment as soon as such equipment could be made available.

3. A task force composed of the interested parties be formed by July 1, 1969, for the purpose of exploring the specific requirements for the regional remote and radio network demonstrations. The task force should report within sixty days and set forth a timetable for the implementation of the experiments.

Statement for

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

by

Harold E. Wigren

before the

Subcommittee on Communications and Power

House Committee on Interstate and Foreign Commerce

on HR. 10268 and 10510

Regulations pertaining to CATV Systems

May 20, 1969

I am Harold E. Wigren, Educational Television Consultant for the National Education Association, and President of the Joint Council on Educational Telecommunications. I am here today to present the views of the Joint Council regarding the present and future possibilities which cable television offers for American education.

The Joint Council on Educational Telecommunications is a consortium of fourteen of the leading national educational organizations in this country. Besides the one-million member National Education Association, which I represent on the JCET Board, the other constituent members of the Council are the following:

American Council on Education

American Association for Higher Education

American Association of Junior Colleges

American Association of School Administrators

Council of Chief State School Officers

Department of Audiovisual Instruction (NEA)

Interuniversity Communications Council (EDUCOM)

Institute for Development of Educational Activities (/I/D/E/A/)

National Association of Educational Broadcasters

National Association of State Universities and Land-Grant Colleges

National Catholic Educational Association

National Educational Television (NET), and the

National Instructional Television Center.

The JCET serves its members, and all of American education, as a clearing-house for information about the educational implications of electronic communications, as a focal point for formulation of educational policy, and as a spokesman for education's interests in electronic communications.

Historically, the present JCET is the continuation of an organization established by the educational community almost twenty years ago. Then known as the Joint Committee on Educational Television, the JCET spoke before the Congress and the Federal Communications Commission of the possibilities which the then-new technology of television might offer for education and for the people. The JCET was in the forefront of the effort to have television channels reserved for noncommercial broadcasting. That effort was, of course, successful. Had not the Congress and the commission accepted JCET's recommendations and acted promptly--while action was still possible--ETV and public television would not have been possible today.

Once again, we are at a critical juncture in the development of both communications technology and public communications policy. Once again, it is most important that American education examine emerging communications technology, including cable communications and communications satellites, study the implications which new developments have for meeting educational and social needs. We must speak clearly and loudly to insure that education will have adequate access to new forms of communications. Communications, in this country, is regulated "in the public interest, convenience, and

necessity" and there can be no argument that education, from preschool to postdoctoral, is part and parcel of "the public interest, convenience, and necessity."

In studying the implications of CATV for education, it is clear that the question must be examined in two phases: What are the present relationships, real and potential, between CATV and education? Secondly, we must, as we did in 1950 in the matter of broadcast television, address ourselves to the long-range future. The policies which are made in the next months or the next years will determine the shape of the future for many years to come. What, then of education and the future of cable communications?

At present, there is a small, but rapidly growing recognition that CATV and education can cooperate to their mutual advantage. The Federal Communications Commission has expressed its interest in program origination on CATV systems as a means of providing a local voice for communities which, because of economics or geography, may never have a conventional television station of their own. In a number of communities, local schools and colleges, with the cooperation of the local CATV operator, have already found in this new means of communication a television service which might not otherwise be possible. In Moab, Utah; in New Ulm, Minnesota, and elsewhere, the local schools are able to provide an instructional television service to classrooms via CATV. In Oregon, the University of Oregon and Clatsop Junior College are able to extend the services of their campus closed-circuit TV systems to CATV subscribers in their homes.

Clearly, there are mutual benefits in such arrangements. The educational institution is freed from the expense of constructing broadcast, 2500 MHz, or cable transmission facilities. The cable operator, in turn, not only garners substantial good will from his service to education but is enabled to offer subscribers and potential subscribers new program services at minimal cost to himself.

In the educational community, the JCET and its member organizations have been encouraging educators to explore the possibilities for service via CATV. Our publication, **JCET DATA BASE**, on "CATV and Future Cable Communications" is one example. An article which appeared in the most recent **Hot Line**, published by the American Association of School Administrators and distributed to more than 20,000 school superintendents across the nation, is another. Both are attached here.

In the CATV industry, Mr. Ford and the National Cable Television Association have issued a Statement of Policy endorsing, in principle, our own efforts to have one or more channels on CATV systems dedicated to educational and other noncommercial uses.

But if CATV and education have common interests, they are not always commonly recognized, and not all of their concerns are mutual. The willingness of some CATV operators to cooperate with educational interests is marred by a few who have looked upon educators in their communities merely as "customers."

Many CATV systems have served education well by extending the range of ETV stations to communities, subscribers, and schools which might not otherwise be able to receive the benefits of broadcast public and instructional television. The present and the proposed rules of the FCC, however, would permit CATV systems to "import" ETV signals without first requiring the permission of the originating ETV station. Under the FCC's proposed rules, such "retransmission consent" would be required of commercial stations. We believe that ETV stations should likewise have control over the use of their signals, lest an ETV signal from a far-off community do unwitting damage to the viability of an existing or potential local ETV service. As the Joint Council stated in its recent submission to the Federal Communications Commission, "Our object is not to oppose the wider availability of ETV signals––that is clearly desirable––but merely to assure that opportunities for local ETV stations as means of community expressions are not diminished thereby."

We have looked at the present state of the CATV art: cable's ability to extend the reach of public television stations (where such extension will not undercut the possible growth of new ETV stations), and cable's ability, and often its willingness, to provide new educational services to the schools, the universities, and the homes of the communities which it serves.

In the future, the technical potentials of cable communications appear to offer a vast and impressive array of new opportunities. It is clear that the leaders in CATV and the Federal Communications Commission together look toward a day in which the carriage of off-air television signals is but a part, and perhaps no longer the most significant part, of what cable does. It is unnecessary to recount here the full

range of communications services which are technically possible via coaxial cable. In its recent Notice, the FCC states:

> It has been suggested that the expanding multichannel capacity of cable systems could be utilized to provide a variety of new communications services to homes and business within a community, in addition to services now commonly offered such as time, weather, news stock exchange ticker, etc. While we shall not attempt an all-inclusive listing, some of the predicted services include: Facsimile reproduction of newspapers, magazines, documents, etc.; electronic mail delivery; merchandising; business concern links to branch offices, primary customers or suppliers; access to computers; e.g., man to computer communications in the nature of inquiry and response (credit checks, airlines reservations, branch banking, etc.), information retrieval (library and other reference material, etc.), and computer-to-computer communications; the furtherance of various governmental programs on a federal, state, and municipal level, e.g., employment services and manpower utilization, special communications systems to reach particular neighborhoods or ethnic groups within a community, and for municipal surveillance of public areas for protection against crime, fire detection, control of air pollution and traffic; various educational and training programs, e.g., job and literacy training, preschool programs in the nature of "Project Headstart," and to enable professional groups such as doctors to keep abreast of developments in their fields; and the provision of a low-cost outlet for political candidates, advertisers, amateur expression (e.g., community or university drama groups) and for other moderately funded organizations or persons desiring access to the community or a particular segment of the community.

The JCET and its constituent members welcome this potentiality. It is obvious that many of the future possibilities of which the commission writes are of direct and immediate concern to the educational community and that to foster such services is to promote the advancement of education.

Because we believe that the present potentials of CATV for education are substantial, and because we believe that the opportunities inherent in this new technology may increase by several orders of magnitude, the Joint Council on Educational Telecommunications has asked the Federal Communications Commission, and now asks the Congress to assure that education's access to this communications instrumentality be guaranteed as a matter of public policy.

As this subcommittee already knows, the year-long study in New York by the Mayor's Task Force on CATV and Cable Telecommunications resulted in the recommendation that at least three channels on any CATV system franchised in New York be set aside for noncommercial use by the city without cost. The FCC has commented favorably on this idea but has suggested that such reservation be handled at the local franchise level. We believe that this is inadequate to the importance of the matter.

Typically, the relationship between education and CATV in any given case is the result of the interplay of three major factors; the sophistication of the local franchising agency; the degree of interest expressed by the local educator **before** the franchise is granted; and the interest in education of the CATV franchise applicant.

In New York, the franchising agency (the city government) was able to commission a thorough study by a knowledgeable citizens' group with the result indicated above. It is all too obvious that such insight is not often available to local government.

Educators are but now awakening to CATV and the means it may provide for furthering educational and social goals. On Long Island, SCOPE (the Suffolk County Organization for the Promotion of Education) is, even now, busy alerting the governing bodies of each township to education's needs for channels **before** the town council is approached by CATV applicants. Again, such activity is atypical and cannot be depended upon to protect the interests of the educational community and the public at large.

Some, but by no means all, CATV operators are aware of the mutual benefits which CATV and education may provide each other. For example, an applicant in Colorado has proposed to provide four channels to educational groups in the area which his system will serve. The efforts of the national trade association of the cable TV industry to encourage such "enlightened self-interest" are appreciated and are to be commended, but education is too important to the nation for such matters to be left to the sophistication and generosity of the CATV franchise applicant.

In the 1940s, public policy dictated that twenty percent of the frequencies for FM radio be set aside for educational and other noncommercial use. In the early 1950s, when new broadcast television channels were established, approximately twenty percent were likewise reserved for educational use. Now, the Joint Council on Educational Telecommunications submits that the interest of the American people requires that a minimum of twenty percent of the capacity of present and future CATV systems should be likewise reserved for educational and noncommercial use.

The phrase "CATV system capacity" is purposefully chosen. For one thing, not all CATV systems are capable of delivering the same number of channels. Older CATV systems transmit only three or five

channels. Most newer systems transmit twelve channels. Systems of twenty or more channels are now under construction and may be commonplace in the future.

But the "system capacity" is not equal to the number of channels transmitted. It appears technically possible that even the older three- to five-channel systems might add "private" "nonstandard" channels for the schools (or for other special audiences) in the region below Channel 2. As multichannel CATV systems increase, education's access to such new services should likewise increase. No "hard figure" of one, three, ten or thirty channels would be equitable, either to the CATV operator or to the educator.

Further, not all of the proposed services of cable communications can be measured in "TV channels." Facsimile, computer communications, and other new services may require less spectrum bandwidth, or more. Only a percentage of system capacity can insure education's access to new services, including those yet undreamed.

The Joint Council submits that, if the public interest can require that CATV operators engage in the origination of "cablecasting" programing as a condition of carriage of off-air television signals, it can, and should, likewise require that free access be granted to education at all levels for those important services which the broad educational community can provide for all our citizens.

Further, to the extent that program origination by the educational community meets the needs which the commission and the Congress rightly see for "local self-expression," the JCET submits that such programing by educational and other noncommercial groups should be taken into consideration when assessing the responsibilities of the CATV operator.

Finally, as commercial radio has long had its noncommercial counterpart, and as commercial television has long had its noncommercial counterpart, we believe that consideration should be given the yet untried concept of public cable communications. We believe that this committee, and the Congress, should give its support and encouragement to "noncommercial CATV" whereby a school, a college, or a nonprofit corporation specifically organized for such a purpose might provide those services which present-day CATV provides, and at comparable charges to the subscribers, reinvesting its revenues in experimentation with new services, such as library information retrieval, and new audiences, such as partially underwritten services to the inner city and/or the remote rural farm.

It is all too easy to view the questions of cable communications in the context of the disputes between commercial broadcaster and commercial CATV operator, but such a context obscures the concerns of that party at interest which is most important, and to whom the Congress and the education are alike responsible, the American public.

We ask that you join us in focusing attention, not on private profits and positions, but upon public goals.

Thank you for the opportunity to appear today, and to submit these remarks for the record.

Attachments:

JCET DATA BASE No. 1 – CATV and Future Cable Communications

AASA Hot Line

Comments on the JCET in FCC Docket No. 18397

Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D. C. 20554

In the Matter of	)	
	)	
Amendment of Part 74, Subpart K of the Commission's Rules and Regulations Relative to Community Antenna Television Systems; and Inquiry into the Development of Communications Technology and Services to Formulate Regulatory Policy and Rulemaking and/or Legislative Proposals.	)	Docket No. 18397

Before the Commission:

COMMENTS OF THE

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

Comes now The Joint Council on Educational Telecommunications (hereinafter JCET), and through its attorneys, files herewith its comments in the above-captioned proceeding.

A. The JCET's Interest in the Instant CATV Proceeding.

1. The JCET has as its constituent members: American Association for Higher Education, American Association of Junior Colleges, American Association of School Administrators, American Council on Education, Council of Chief State School Officers, Department of Audiovisual Instruction, NEA, Interuniversity Communications Council (EDUCOM), Institute for Development of Educational Activities (/I/D/E/A/), National Association of Educational Broadcasters (NAEB), National Association of State Universities and Land-Grant Colleges, National Catholic Educational Association, National Education

Association, National Educational Television, and National Instructional Television Center. JCET speaks for the nation's teachers and school administrators, for the schools, colleges, and universities, and for the educational broadcasters. It speaks for the educational community and derivatively for the public at large.

2. JCET is the successor to the Joint Council on Educational Broadcasting (JCEB) and the Joint Committee on Educational Television. The Commission is familiar with the crucial role played by JCET during the early television allocation hearings in establishing as a basic principle of national communications policy that spectrum space be reserved for noncommercial educational purposes. JCET is carrying on and broadening the scope of this early commitment. The primary purpose of JCET is "to study, coordinate, guide, and stimulate the applications of the techniques and media of electronic communications to the problems and requirements of education at all levels."[1]

3. The JCET and its constituent members are deeply interested in the issues raised in the instant proceeding, which is designed to explore broad questions respecting the role of CATV in the developing communications technology for the public, and the relationship between CATV technology and other forms of communications media in this country. Parts III and IV of the Commission's proposals, to which these comments are directed, offer proposed rules concerning CATV program originations and related matters, technical standards, reporting requirements, and proposed new automatic procedures relative to the importation of television signals by CATV systems. Comments have already been filed by well over 100 parties to specific aspects of Parts III and IV relating to program originations and the issue of

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[1]There is quoted below in full for the Commission's information the Purposes Clause from Section 1.1 of the JCET by-laws. Section 1.1 Purpose: To study, coordinate, guide, and stimulate the application of the technologies of electronic communications to the problems and requirements of education at all levels; to provide a clearinghouse for research and development activities and an information center; to inform the educational community of the status, potentialities, and technological development of telecommunications; to provide a mechanism by which education may determine its requirements in this area and to advise all interested parties appropriately of these requirements; to give continuing attention to the implications of telecommunications for domestic and international educational cooperation; to provide a forum that will facilitate the establishment of standards necessary for education's effective use of electronic communication; and to act as a catalyst for research, information, and development activities in the field of educational telecommunications.

diversification of control of the media of mass communications. Part V, with respect to which comments are due next month, raises a number of broad questions concerning the nature of national communications policy, extending beyond the immediate issues respecting CATV and soliciting comments on the effect of potential new specialized communications developments upon present communications technologies, and particularly the social, political, and economic considerations raised by such developments.

4. The JCET, which was formed for the specific purpose of acting as a catalyst for research, information, and development activities in the broad field of educational telecommunications, has from its inception devoted its attention to the fostering of electronic communications media which would benefit the cause of education. Many of its efforts and the efforts of its predecessor, especially those involving pleadings and testimony before this commission, have been directed toward advancement of educational television and radio broadcasting, including the establishment and preservation of the commission's reservations policies in these areas. But the areas of interest of the JCET far transcend open-circuit educational broadcasting alone. Its interests range from audio-visual materials to closed-circuit communications systems to computerized techniques for the swift availability and exchange of educational materials, to proposals for educational utilization of satellite transmissions. Its aim is to encourage and expand cooperative efforts, by local, state, regional, and nationwide agencies and authorities, to make available to educators at all levels the best and the latest in technological hardware to perform the jobs that must be done to offer quality education in this modern age. The JCET desires to foster new forms of communications media which can aid in this process. For this reason, the JCET commends the commission for its forward-looking proposals, and for its awareness of the necessity for careful planning now to ensure that these rapidly developing technologies in the communications field will be fully utilized in an effective manner to meet the demands of the next decade and the years to come.

B. The Necessity for Complementary Communications and Distribution Systems to Serve Educational Telecommunications Needs.

5. In this connection, it is essential that the commission should not single out one particular medium for consideration but should recognize that in communications as in education itself, complementary systems must be provided so that there will be a variety of means available to match the

variety of needs, educational and otherwise, to be served. The educational processes make use of many communications tools to assist both the teacher and the learner. In one situation, slides or written materials may suffice; in another, motion pictures may serve the purpose; for selected groups or projects, closed-circuit systems, or an Instructional Television Fixed Service system may be perfectly appropriate. The local educational radio or television station, or a regional system, or the national interconnected television service may perform needed functions, both in terms of strictly instructional programing or in terms of broader cultural, informative, and educational services. The many services of CATV, with respect to additional programing channels, special nonbroadcast educational channels, or channels devoted to storage-and-retrieval functions, or intra- or inter-institutional exchange, may at times be the essential technique needed for a particular educational purpose. It is impossible to predict the exact communications system that will be needed for the vast variety of educational experiences, but it is possible to predict that all of them will be needed at one time or another, and that all should be readily available upon call. More often than not, a combination of the various tools will be demanded at most times, and one should not arbitrarily be emphasized over another. The vastness of the educational task requires a wide, full, and unfettered variety of communications and distribution facilities which may be employed whenever the occasion demands.

6. The JCET is naturally concerned with adverse impact which a new medium such as CATV may have upon the established and necessary pattern of local educational broadcasting outlets. At the same time, it is convinced that arbitrary and unreasonable obstacles should not be placed in the path of CATV, which offers the hope for significant improvements in the diversity of programing fare to communities and citizens now lacking such variety, and offers in addition the opportunity for an infinite range of specialized nonbroadcast usages, through the availability of multichannel, multipurpose, interconnected communications distributions systems.

7. The commission's revised and new proposals concerning CATV have stemmed in large part from the rapid evolvement of CATV from a small five-channel reception service in rural areas toward twelve-channel systems, twenty-channel systems, and even greater capacity, the proposed entry of CATV into large metropolitan centers, and its plans for a variety of new services which can be provided to the

American public. Paragraph 8 of the commission's decision catalogues some of the predicted services which the expanding multichannel capacity of cable systems may offer:

> facsimile reproduction of newspapers, magazines, documents, etc.; electronic mail delivery; merchandising, business concern links to branch offices, primary customers or suppliers; access to computers, e.g., man to computer communications in the nature of inquiry and response (credit checks, airlines reservations, branch banking, etc.), information retrieval (library and other reference materials, etc.) and computer-to-computer communications; the furtherance of various governmental programs on a federal, state, and municipal level, e.g., employment services and manpower utilization, special communications systems to reach particular neighborhoods or ethnic groups within a community, and for municipal surveillance of public areas for protection against crime, fire detection, control of air pollution and traffic; various educational and training programs, e.g., job and literacy training, preschool programs in the nature of "Project Headstart," and to enable professional groups such as doctors to keep abreast of developments in their fields; and the provision of a low-cost outlet for political candidates, advertisers, amateur expression (e.g., community or university drama groups) and for other moderately funded organizations or persons desiring access to the community or a particular segment of the community.

The JCET and its constituent members also welcome this potentiality of cable and view CATV as a potent vehicle for the broad dissemination and exchange of information, and an essential aspect of any meaningful and comprehensive system of educational telecommunications in America. One of JCET's constituent members, the NAEB, has already filed comments urging broad support for CATV's potentialities in these areas, consistent with the protection which must be assured to existing and future local educational broadcast systems, and all of the other constituent JCET members share these same goals.

8. The commission's objectives in Docket No. 18397, like the objectives which guided its Second Report and Order and its accompanying rules and regulations in 1966, are to foster the development of these beneficial potentialities of CATV, by encouraging a diversity of television signals and other services in as many communities as possible, while at the same time recognizing that the unplanned availability of CATV service may impinge upon the establishment and healthy maintenance of local broadcast service. In many respects, the commission's various proposed policies, as outlined in greater detail below, serve to achieve these twin objectives; in Part III by its proposals for diverse cable television services; and in Part IV by its retransmission-consent, thirty-five-mile zone, distant-signal rules. While the JCET believes that many of these proposals are meritorious and should be adopted by the commission, the JCET also believes that

the commission's Notice of Proposed Rule Making and Notice of Inquiry in Docket No. 18397 has neglected to relate its CATV proposals to the needs and requirements of educational telecommunications. The notice fails to discuss in any concrete fashion either the priorities that should be accorded educational services via CATV or the protections that should be afforded educational services against the perils of indiscriminate CATV importations.

C. Part III of the Commission's Proposals: The Encouragement of Diverse CATV Services, and the Necessity for a Reservation Policy to Insure a Fair Share of Available Channel Capacity on CATV Systems for Noncommercial Educational and Public Service Use.

9. **Areas of Local Concern.** In paragraphs 21 and 22 of its Notice, the commission has indicated that it intends, "at least initially, to rely largely on local authorities to see to it that CATV meets local communications requirements and interests to the satisfaction of the community." The commission invites local authorities to consider additional requirements to insure consumer protection in the CATV area, including the provision of channels for public or municipal use. The commission has inquired whether local consideration and disposition of such matters as applicant qualifications, service areas, CATV system plans, and local channel usage should be made a condition for the carriage of broadcast signals by the CATV system. Also, "in those relatively few instances where there need be no local franchise consideration," the commission has requested comments "on whether federal consideration is not then appropriate, and if so, our authority so to proceed."

10. In the development of CATV, local franchising authorities have historically felt free to impose certain specific requirements, including in some instances the condition that some channel capacity should be reserved for municipal use or for educational use. The commission has indicated that it believes that "a requirement of this nature is appropriately the function of local or state franchising agencies." The JCET is deeply concerned about the nature and extent of reserved channels, particularly those to be set aside for noncommercial educational and public service use, and it firmly believes that this matter is too important for the future of CATV to be left in its entirety to the vagaries of local franchising. As set forth below, in its consideration of the commission's common-carrier concepts for CATV systems, the JCET is of

the opinion that the commission itself must play a vital role in assuring adequate reservation of CATV channels for noncommercial educational and public service use.

11. Under existing circumstances, and in view of the variety of franchising authorities, at least three factors typically are involved in the local franchising authorities' attitude toward CATV channel reservation:

a. The sophistication of the local franchising agency may be critical. In New York City, the mayor commissioned a year-long study by a special task force of noted citizens who were well-acquainted with CATV. That task force included among its recommendations a requirement that all CATV operators in New York City must as a condition of their franchise, provide three channels to the city without cost, in addition to the required carriage of three noncommercial educational television stations. In a smaller community, however, such resources would not normally be available to assist the local franchising authority, which could be guided by political or other pressures to award franchises without consideration of the public service use which might be made of a portion of the available channel capacity. While the JCET acknowledges that the commission would, in accordance with its long-standing practices in these areas, accord full respect to local considerations and requirements, the JCET also urges the commission to do all in its power, within the context of this proceeding, within the context of particular CATV proposals before it, and in formal or informal conferences which might properly be arranged at state or regional levels, to aid in the educative process of local franchising authorities, so that intelligent use will be made of the powers vested in those authorities. The JCET is aware that many such local agencies are rapidly becoming better versed in these areas and are recognizing that CATV franchises need not be awarded on an unconditional basis to the highest or the most diligent bidder but may instead be conditioned upon appropriate return value in terms of public service channels or the satisfaction of specific local needs and interests. But there is much that still must be done before this commission may safely rely completely upon local franchising to satisfy essential public interest services. Moreover, the JCET believes that the broad public interest standard which guides commission action would sufficiently embrace federal consideration of such matters as reserved channels for noncommercial educational and public service use, should the local authorities fail to take such matters into account in its franchise grant, or should no local franchise be required.

b. Of equal importance is the expressed interest of the educational and public community before the local franchising authority when CATV franchises are being considered. For instance, on Long Island and educational group, Suffolk County Organization for the Promotion of Education (SCOPE), has been alerting the governing bodies of each township to education's need for channels before the town council is approached by potential CATV operators. Many educational broadcast stations across the country devote many hours of activity to these prefranchise educative campaigns. Some stations have discovered that it takes the full time of one staff man to handle matters such as these and others related to CATV operations in their broadcast service areas. But a large number of educational stations and educational institutions are either unaware of the possibilities of securing favorable conditions in CATV franchises to serve their educational goals, or else are hampered or even forbidden by tight budgets or local restrictions from engaging in such prefranchise activities.

c. A third important factor is the degree of sophistication, or concern with educational matters, exhibited by the CATV applicant. Some CATV operators and applicants are motivated by sincere public concern to espouse the reservation of channels for educational or municipal or other public use. Others, motivated by the contemplated profitability of CATV, nevertheless have suggested making channels available for education or other public service usages, because of the advantage in terms of competitive edge in the franchise proceeding and in public relations to the community. The experiences of educational interests have demonstrated that more and more CATV operators and applicants have been desirous of serving these broader goals, have even proffered free CATV facilities and studios, and have installed receivers in designated locations free of charge for educational uses. One CATV operator in Colorado has proposed to make five channels available to education, including two-way capability for feedback utilization. Numerous other such instances of public service concern by CATV systems could be recounted. But the fact remains that the degree of such concern varies from operator to operator, and the question of reservation is too fundamental to be left to the personal choice or advantage of the local CATV operator.

12. For these reasons, the JCET believes that national policies should be formulated to assure that a fair share of channel capacity on CATV systems will be utilized for noncommercial educational and public service purposes. The commission's expressed determination that program originations "on CATV systems would serve the public interest as a means for increasing the number of local outlets for community

self-expression and for augmenting the public's choice of programs and types of service." Notice (paragraph 13) recites a parallel national policy. The JCET submits that the commission's concern for diversity of program fare, for program originations on CATV systems (possibly on a noncommercial basis, as indicated in its **Midwest Television** precedent, 13 FCC 2d 478, 505–506), and for diversification of control of the media of mass communications (Notice, paragraphs 23–25) would be advanced by a comprehensive statement of national policy in this area which would establish priorities of service and furnish the parameters of federally reserved channel space for these educational and public service objectives. Such a proposed priority program is described immediately below.

13. **Common Carrier Operations and the Necessity for a Noncommercial Educational Reservation Policy Respecting CATV Systems.** In a very real sense, the instant proceeding is akin to the commission's overall television proceedings in the late 1940s and early 1950s. At that time, the commission weighed the importance of incorporating within the national allocations pattern a policy of assuring a fair share of television spectrum space for noncommercial educational television broadcast use. In an historic decision in 1952, the commission reserved 242 channels for exclusive noncommercial educational broadcast purposes, paralleling action it had earlier taken to reserve a band of twenty channels for exclusive noncommercial educational use in the area of FM broadcasting. Since 1952, an integral component of the national allocations scheme has been the commission's educational reservation policy, acknowledging that "it will generally take the educational community longer to prepare for the operation of its own television stations than it would for some commercial broadcasters" (1 RR 91:601, 91:614), and confirming that the public interest required the dedication of a portion of available spectrum for essential educational and public service usage. The JCET and educational interests have always placed their faith in this reservations policy, which gave priority to the nation's educational goals and needs. An assignment plan with assured educational reservations is an insurance policy that education and public service will not be neglected and that space will be available for the educational and public service facility, which cannot compete successfully with commercial interests for limited spectrum space. In 1969, a new and basic national allocations decision must be made, this time respecting the phenomenon of cable television. Throughout its Notice, the commission has reiterated that this developing multichannel technological system should be designed to serve essential social, cultural, and educational purposes as well as commercial entertainment

purposes. CATV, like television itself, should also operate to a significant extent as an "outlet for noncommercial community self-expression" (Notice, paragraph 5). But while its goals were boldly stated, the commission's specific proposals for guaranteeing "noncommercial community self-expression" were restricted in nature. It would require but a single channel to be devoted to such purposes, and to be operated by the CATV owner. It welcomed local requirements but imposed no guarantees that local requirements would be served on any priority basis. It knew of the vast public service potentialities of CATV but left the standards for achieving that public service potentiality open to varying and uncertain influences.

14. It is mandatory that the potentialities of CATV as a programing and distribution system should not be lost to education and public service. The commission has both the power and the obligation to make certain that CATV systems satisfy public interest obligations by demonstrating that a reasonable portion of its channel capacity is preserved for these important public goals. The JCET believes that these goals may be met by a commission determination that a minimum of available CATV channels should be set aside exclusively for noncommercial educational and public service uses. The same reasons which prompted the educational radio reservation of one-fifth of available FM channels, and which prompted the educational television reservation of, by present count, much more than one-fifth of available VHF and UHF television channels, likewise prompt a commission policy which would reserve at least one-fifth, or twenty percent of available CATV channel space for education, information, culture, and public use.

15. The JCET proposes that the commission should establish four priorities of service, or channel usage, to be followed by all CATV systems. See, in this connection, the NAEB comments filed April 3, 1969, which proposed a comparable priority system. To the extent permitted by channel capacity, CATV operators would be obligated to meet the requirements of each of the following categories of service before allocating channels to the next lower priority:

a. Television station signal carriage, as required by existing commission rules.

b. Requirements imposed by state or local franchising authorities. This conforms with the commission's desire to rely, at least initially, upon local authorities to guarantee the "provision of channels for public or municipal use." See paragraphs 10–13, **supra**.

c. A minimum of one-fifth, or twenty percent, of available channel space on a free or reduced rate basis for local noncommercial educational and public service use in cooperation with the local educational station or state and local educational agencies. These channels would be made available after satisfaction of priorities (a) and (b) above, and would not be limited to those to be used for local educational broadcast service. However, any channels made available under priority (a), e.g., carriage of local or distant educational television signals, or priority (b), e.g., channels required to be set aside for educational or public service use, except those strictly reserved for special municipal use, would be counted within the twenty percent priority for educational and public service usage. For instance, in a twenty-channel CATV system, seven channels might be utilized for carriage requirements under priority (a), including the local educational signal; two channels may have been dedicated to special local uses free of charge, one for municipal governmental use and one for the board of education for its exclusive use to carry only educational information about the schools and programs of an educational nature, under priority (b). This would leave available eleven channels for new uses, and of this total, a minimum of two would be required to be dedicated to educational and public service purposes, for a total of four channels (the local educational signal, the board of education channel, and the two additional channels), or one-fifth of the total of twenty available channels. Of course, the CATV operator would be free to dedicate additional channels for such purposes beyond the twenty percent minimum, but at the very least, local educational and public service organizations could be assured that no less than four channels would be set aside for their own purposes. Under priority (c), therefore, the opportunity would be presented for extra noncommercial educational television channels in communities in which only one open-circuit educational television channel has been allotted, or where multiple reservations are necessary. But the priority (c) channels would not be limited to those to be used for local educational broadcast service. They would be available for all types of local community entities with production capabilities, e.g., public school systems desiring to implement or improve instructional television fixed services, private school systems, colleges and universities with specialized needs for CATV services, civic and cultural organizations, specialized groups within the community, e.g., police, firemen, lawyers, doctors, or welfare agencies, which have needs to be fulfilled in terms of reaching the public with informational programing to be provided by such groups. Under this priority, there would be a guarantee that excess capacity on CATV channels is funnelled to public service functions prior to satisfaction of private or commercial needs for CATV service. In this

connection, the NAEB comments in this proceeding had suggested that priority (c) channels be "One or more channels available on a free or reduced rate basis (or percentage of channels available after satisfaction of priorities (a) and (b) above)" (Comments, p. 26), but the JCET submits that a percentage of channels is preferable to a fixed number of educational and public service channels, so that the number of available channels dedicated to such usages would automatically increase as the channel capacity of the system increased. If for any reason the local educational and public service organizations could not utilize all such channels at any one time, the excess channels would be available for other uses, but would be preemptible by educators and others if and when they are able to utilize them. The commission's expressed interest in CATV, as in its allocations policy, is in the promotion of local outlets of expression, and it looks toward requiring CATV operators to engage in program origination in keeping with this policy. To the extent that program origination by local educational and public service organizations over such dedicated channels as suggested here would enable CATV to meet the need for a local means of expression, the JCET suggests that it may be reasonable to take such programming into account in assessing the program origination responsibilities of the CATV operators themselves.

d. General common carriage usage, as contemplated by paragraph 26 of the commission's proposals. Such channels would provide programing or services originated by any agency or enterprise in the community for either public or private purposes. Ordinary principles of provision of facilities by common carriers would apply, except as necessarily modified by technological limitations on system capacity.

16. The priorities specified above would apply with respect to all CATV systems, except those which are nonprofit in nature. For nonprofit CATV operators, program originations, above and beyond satisfaction of priorities (a) and (b) above, would be permissible.

17. It is not proposed that CATV operators would incur all of the incremental costs for priority (c) channels. Any such requirement would be burdensome to CATV operators, particularly those with relatively small systems. It is contemplated, rather, that priority (c) would envision simply the availability of channels, just as educational FM and TV served channels guarantee only availability of channels for designated purposes, and that the actual construction and operating costs would be the responsibility of the educator or other eligible user group, subject to whatever mutual arrangements for

cost-sharing or free services and facilities might be established by negotiations between the CATV operator and the educator or other eligible user group.

18. Most CATV systems deliver program signals over the conventional Channels 2–13, but are also capable of carrying additional channels in the spectrum regions below Channel 2, between Channels 6 and 7, and above Channel 13. Such channels cannot be seen without the use of special convertors. Typically, they would not reach the general audience in the home, but could reach special, convertor-equipped audiences such as doctors, schools, day-care centers, etc. Many of the older, small five-channel systems are already filled to capacity, and the addition of an educational channel would require deletion of an existing service to subscribers unless the additional educational services were provided via such nonpublic channels. Utilization of such nonpublic channels would require an engineering sophistication not always comprehended by CATV operators, or potential user groups, or the commission. But it would appear to be perfectly feasible to make use of such nonpublic facilities for certain special educational or public service uses. However, it should be clearly understood that use of any such nonpublic channels would not be counted in establishing the minimum twenty percent requirements for available conventional channels. Moreover, the JCET proposes that a minimum of at least twenty percent of available nonpublic channels would also be reserved on a priority basis for educational and public service use.

D. Part IV of the Commission's Proposals: The Importation of Television Signals, and the Necessity for Adequate Protection of Noncommercial Educational Broadcast Stations.

19. The commission's proposed rules generally require retransmission consent by the originating station prior to the importation of distant commercial signals, with respect to the top 100 "major television markets" and "Footnote 69" situations (Sections 74.1107 (b) and (c)), and with respect to the "smaller television markets," except for designated permissible importations (Section 74.1107 (d)). In all of these instances, however, the commission's proposed rules allow importation of the signals of any noncommercial educational television station, "in the absence of timely objection filed pursuant to Section 74.1109 . . . by any local educational station or by any local or state educational television agencies." The commission has indicated that, as an interim measure during the pendency of this proceeding, it will permit CATV systems to commence distant signal operations which would be permissible

because they fall outside the zones proposed in the rules, and other operations which would be entirely consistent with the proposed rules. The net effect of these rules, insofar as educational stations and educational authorities are concerned, is that the burden of proceeding and persuasion falls upon them to come forward with timely objections to proposed distant signal importations pursuant to the provisions of Section 74.1109. Educational stations and educational authorities would be the only broadcast entities which must carry such a burden. For all other broadcast entities, a straightforward, go-no-go rule would apply with respect to distant signal CATV importations.

20. The JCET believes that this separate and more onerous procedure for educational television stations is unfair and discriminatory. These burdens are particularly inappropriate, inasmuch as these nonprofit noncommercial educational stations have neither the funds nor the personnel to maintain constant vigilance in these matters, or to initiate costly proceedings of this kind before the commission.

21. The NAEB and other educational groups have filed vigorous objections to these proposed procedures, and the JCET joins in these voiced objections. In effect, the commission by fiat has incorporated an exception for educational television signals which it had earlier proposed in Docket No. 17597, concerning the former distant-signal rule in Section 74.1107, and which had produced near-unanimous opposition by educational television interests. Chairman Hyde and Commissioners Robert E. Lee and Cox had dissented to the earlier proposals, and Commissioner Cox had declared that it "unfairly discriminates against educational television interests." The commission has shown no valid justification for this separate treatment, nor would it add to administrative convenience, inasmuch as it contemplates the inauguration of the very hearing process that the commission has attempted to obviate by its automatic CATV procedures in this proceeding. The JCET believes that Sections 74.1107 (b), (c), and (d) of its proposed rules should be revised at once, along the lines of the specific changes set forth in paragraph 12 of the comments filed herein on April 3, 1969, by the NAEB. Adoption of these modifications would provide parity of treatment between educational and commercial stations. The JCET is convinced that educational stations themselves respect the advantages to be gained from augmented educational and cultural programing for their own service areas via CATV, and that the retransmission consent procedures would not be utilized to hamper the free flow of such information and general

educational programing to the maximum extent possible unless such specific importations would have a grave impact upon the operations and viability of the local educational station. Our object is not to oppose the wider availability of ETV signals––that is clearly desirable––but merely to assure that opportunities for local ETV stations as a means of community expression are not diminished thereby.

CONCLUSION

22. The JCET believes that the commission's proposals in its new look at CATV as modified by the suggestions contained herein are meritorious, and should be adopted by the commission. At the present time, there are close to 3,000 operating CATV systems, and by all indications, this number will grow rapidly in the next few years. CATV holds enormous promise for the future, especially in terms of satisfaction of the manifold needs of American education. The commission, in its deliberations herein, should take major steps to cultivate the vast potentiality for diversity of services that CATV promises. At the same time, the commission should adopt clear priority standards, as proposed in paragraph 16, **supra**, to devote a minimum of twenty percent of available CATV channel space to important noncommercial educational and public service uses. By such action on the commission's part, significant progress will be made in advancing the cause of local diversity and experimentation in services to the public, and also the cause of education. By comparable action in assuring parity of treatment by educational and commercial stations in the area of importation of distant television signals, as proposed in paragraph 24, **supra**, the commission will give new recognition to its commitment, stated in its **Second Report and Order on CATV**, 2 FCC 2d 725, 762, that

> As in the case of commercial stations, CATV's role is to supplement rather than to supplant, local educational broadcast service. The national policy of encouraging the full development and expansion of ETV is reflected in the grants-in-aid legislation (Public Law 87–477) and has long been a matter of deep concern to the commission (sixth report and order, pars. 33–49). It would be plainly inconsistent with that policy to accord educational stations less protection than commercial stations if there is any real likelihood of prejudice flowing from CATV importation of outside ETV signals. Considering the continuous financial struggle of ETV and its dependence upon local financial support and interest, we think that the possibility of adverse effect is sufficiently strong to warrant some special protection for ETV.

By accenting the positive capabilities of CATV to aid education and minimizing the negative attributes of CATV which may thwart essential local educational goals, the commission's decision in Docket No. 18397 will be a basic charter for cooperative use of this new communications and distribution system by CATV operators and educators alike.

Respectfully submitted,

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

By: /s/ Norman E. Jorgensen

By: /s/ Louis Schwartz

By: /s/ Robert A. Woods

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Its Attorneys

JOINT COUNCIL ON EDUCATIONAL TELECOMMUNICATIONS

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September 19, 1969

Dr. Clay T. Whitehead
Staff Assistant to the President
The White House
Washington, D. C.

Dear Dr. Whitehead:

Thank you for the opportunity to comment in the current White House inquiry regarding domestic satellite communications. Our discussions of this matter with the Corporation for Public Broadcasting and the Ford Foundation, and our mutual efforts in the work of the Satellite Task Force, indicate that our common concerns will be well reflected in the submissions which you will be receiving from them. Nonetheless, the matter of domestic satellites is of such importance that we should be remiss if we did not avail ourselves of the opportunity you have offered to respond directly. Rather than present yet another series of detailed responses to the questions you have suggested, we should prefer, in less formal manner, to underscore what appear to be the basic considerations which apply to educational and other noncommercial applications.

We believe that noncommercial applications require special study within their own frame of reference. Their technical requirements, as well as their public benefits, may differ markedly. For example, television transmission to low-cost community center ground terminals (as in ATS-F) may be neither attractive nor desirable within the commercial context, but might offer substantial public benefit in noncommercial applications. The NAS panel at Woods Hole has pointed out that such service could have great value, not only in areas of this country lacking in infrastructure, but also in serving such special needs as those of the medical profession, even where terrestrial facilities are plentiful.

In computer communications, some have indicated that the growing number of computers is likely to so diminish teleprocessing costs that satellites will have little impact. (The GE filing in Docket 16495 appears to indicate a contrary view.) What is true for the use of computers by business and industry may not, however, apply to such educational applications as computer-assisted instruction, inter-university research, and the like. At present, there seems substantial evidence that interconnection costs are a major constraint to the expansion of CAI, and that satellite communications might be most useful.

In short, noncommercial needs may not be congruent with requirements of a commercial service. The dedication of "free channels for educational and instructional television," offered by Comsat in its Pilot Proposal, while unquestionably desirable, may not, alone, be adequate to the task of realizing the full benefits which noncommercial satellite services could offer.

Worthy of fullest exploration is the idea that an independent noncommercial satellite system may be desirable. Such a system might, or might not, share space and ground hardware with a commercial system, but each system would be free to pursue its own goals with a minimum of compromise and confusion. Precedent exists on the ground, where noncommercial broadcasting exists outside of the framework of its commercial counterpart. To a wide spectrum of noncommercial users, it would offer the opportunity to design a system based upon their own needs, and to escape the present constraints of service-oriented tariffs and block allocations which prevent the small user from achieving economies of scale. Many noncommercial applications, not presently viable, might become attractive.

To the common carrier, such a noncommercial satellite system might be seen as engaging in the polar opposite of cream-skimming, relieving the common carrier of the necessity of serving noncommercial users below cost.

We are not suggesting here that such a noncommercial system **should** be established, but only that such an option should not be prematurely foreclosed. Hard, practical, questions need fuller examination, chief among them what volume of traffic might be expected, and how the costs of such a system might be met. Here, as one of your questions suggests, is an area in which research that can be carried out only by the Government would resolve uncertainties.

The system viability clearly increases as noncommercial uses are aggregated. Mr. John W. Macy, in his letter to the President, has urged the convening of a conference on telecommunications technology as a means toward the solution of domestic problems. Such a conference could provide a beginning in assessing the needs for noncommercial satellite communications, not only of Public Broadcasting and education, but of all of the public sector, including the programs of such Departments as Health, Education and Welfare, the Interior, Commerce, and Transportation. It might be possible to share space or ground facilities for communications with those for scientific research. Satellite technology could provide Creative Federalism a new bridge between Federal and State and local programs and agencies.

In short, not merely Public Broadcasting, nor educational telecommunications, would be served, but rather the broadest spectrum of public communications needs. The interest in satellites of the people of Alaska, and of the Lister Hill Center for Biomedical Communications, clearly points in this direction. Whether the ultimate system, should one prove practicable, would be user-supported or government-owned, Federally-sponsored programs would likely be among its chief beneficiaries, and only the Federal Government, representing all of the people, can undertake the exploration of its potential values.

As I pointed out in my letter of May 26th, "an examination of social and educational programs is already underway. So, too, we are already in the process of attempting to shape new communications

policy to cope with emerging technology. What a White House Conference would do is to converge these two currents. . . ."

To the possibilities already suggested––free channels for education provided by a commercial system, a satellite system for all users operated by a new non-profit entity, and a possible joint venture by commercial and noncommercial interests––must be added the concept of parallel commercial and noncommercial systems.

To call attention to such a possibility is not to deny the potential values of other alternatives, but only to urge that the feasibility, costs, and benefits of each configuration be given appropriate study and consideration.

Thank you for the opportunity to comment in this matter.

Sincerely,

Frank W. Norwood
Executive Secretary

FWN.h

The Commission on Instructional Technology And Its Report*

C. R. Carpenter

The efforts of the Carnegie Commission on Public Broadcasting produced the widely distributed report, *Public Broadcasting: A Program for Action*, and expeditiously provided the basic conditions for establishing the Corporation for Public Broadcasting. Left for another commission was the complex problem of instructional television. Legislation in 1967 which extended the federal aid program for television and radio facilities and authorized the Corporation for Public Broadcasting also authorized a federal or national commission to conduct a study and prepare a comprehensive report for the President of the United States on the status potentialities, and roles of television, radio, and other communication technologies which might serve educational needs and future developments.

The nine man Commission on Instructional Technology was selected and recommended by U.S. Commissioner of Education Harold Howe II and appointed by Secretary of Health, Education, and Welfare Wilbur Cohen in the Spring of 1968. It was given a June 30, 1969 deadline to complete the report to the President.

An authorization of $500,000 was made for the work of the Commission, but funds were not provided by Congress; therefore, the U.S. Office of Education furnished funds and contracted with the Academy for Educational Development to administer and support the activities of the Commission.

The Commission consisted of the following persons:

Sterling M. McMurrin (chairman), dean of the graduate school, University of Utah.
David E. Bell, executive vice president, The Ford Foundation.
Roald F. Campbell, dean of the graduate school of education, University of Chicago.
C. Ray Carpenter, research professor of psychology and anthropology, The Pennsylvania State University and University of Georgia.

To Improve Learning, the report to the President and the Congress by the Commission on Instructional Technology, is available from the U.S. Government Printing Office for $.50. The report, released last month, and the work of the Commission is analyzed for *EBR* by Dr. C. Ray Carpenter, a member of the Commission's Executive Committee. He is research professor of psychology and anthropology at the University of Georgia, and is president of the Joint Council on Educational Telecommunications.

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*This summary is reprinted from the April 1970 issue, Volume 4, Number 2, of the **Educational Broadcasting Review** with the permission of the editor.

Nell P. Eurich, dean of the faculty, Vassar College.
Harold B. Gores, president, Educational Facilities Laboratories, Inc.
A. Leon Higginbotham, judge, U.S. District Court, Eastern District of Pennsylvania.
Kermit C. Morrissey, president, Community College of Allegheny County, Pennsylvania.
Kenneth E. Oberholtzer, former superintendent of schools, Denver, Colorado.

Sterling McMurrin was appointed Chairman; he selected Kenneth Oberholtzer and myself to serve with him as the Executive Committee.

The Mission

The task assigned the Commission (CIT) was broad and complex. In the original language of the proposed legislation the work of the Commission was limited to the broadcast media and especially radio and television. Hearings before the Subcommittee on Labor and Education, however, extended the responsibilities of CIT to study the full range of telecommunications, electronic and communicational technologies which are or may be useful to instruction. The other main dimension of the described task, as extended by Commissioner Harold Howe II for the Commission at its first meeting, was coverage of all levels of education and all areas of acute educational problems from pre-school to advanced continuing professional education. It was suggested that special attention be given to how modern communication technologies might assist in the improvement of the schools of large cities and provide instruction for the disadvantaged, including widely dispersed rural peoples. Furthermore, it was requested that the Commission define the roles and functions that the Federal Government should serve in the area of educational and instructional technologies. Most specificially it was urged, also, that from the ten-year background studies and recommendations of the Media Advisory Committee on NDEA Title VII, the roles of the U.S. Office of Education be clearly redefined.

In anticipation of the needs for information the Research Division of USOE under the initiative of Andrew Molnar contracted in 1967 for a series of studies, the results of which would be made available to the Commission when it began its work. Among these studies, three were of special significance:

1. An informal inside study was done of the amount of funds annually invested in media and related resources and activities by the U.S. Office of Education. The study showed that a sum of about three-quarters of a billion dollars was in some manner being invested in educational-instructional media technologies, projects and programs, including the print media.

2. Chu and Schramm (Chu, Godwin G. and Schramm, Wilbur; *Learning by Television.*) once again reviewed studies of learning from television.

3. Carpenter and Carpenter (Carpenter, C. R. and Carpenter, Ruth; "Quality Factors in Instructional Materials.") investigated by intensive authority seminars factors contingent to the quality of instructional media with emphasis on television. Other studies were concerned with the potentials of computer assisted or regulated instruction and system designs applied in instruction.

Methods and Procedures

Of first order of importance was the work of providing the Commission[1] with a sound, broad, and adequate information base for its considerations, deliberations, debates, and recommendations. About 85 papers were collected or contributed and copies were made available to each of the commissioners.[2] 133 pa-

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[1] The work of the Commission was ably administered by Sidney G. Tickton of the Academy for Educational Development (AED). Judith Murphy and Ronald Gross did the difficult job of writing many versions and the final draft of the CIT report. Howard Hitchens and Robert Snider served as consultants. Staff support was provided by research assistants Louise Abrahams, Lane Carpenter, Patricia Wagner, and Nikki Zapol.

[2] Examples of authors and subjects in this category were: Robert Gagné, "Learning Theory, Educational Media, and Individualized Instruction"; John Dietrich and Craig Johnson, "Cost Analysis of Instruction"; James Miller, "The Nature of Living Systems"; James Coleman, "Equality of Educational Opportunity."

pers on pertinent subjects were requested and commissioned by AED.[3] Thus, a total of over two hundred documents, reports, collections, resource papers, and books were made available for study by the Commission.[4]

Robert Snider and Howard Hitchens carried out special assignments of collecting and preparing information. Snider represented the professional audiovisual or instructional technology fields and Hitchens, then at the U.S. Air Force Academy, reviewed developments in the use of instructional technologies in the Department of Defense, and especially in military training. Hitchens emphasized instructional developments and materials in the military which could be emulated and transferred to the civilian sector for use in a wide spectrum of instruction and training.

Site visits were made by the Commission as a whole and by its members. One site visit of great interest and value was made to the U.S. Air Force Academy at Colorado Springs. This institution exemplifies the application of a wide range of architectural and media technologies arrayed to provide approaches and solutions to many different instructional problems. While it was near Denver, CIT went to the Lowry Air Force Base where teaching-learning laboratories were visited and programmed instructional procedures were observed. Other site visits were made to a Job Corps camp in California, to a school in Palo Alto, and to Stanford University where computers are used for assisting or regulating the learning of young children. Visits were made to the instructional materials production center at Newton, Massachusetts and to an educational television broadcast station, WGBH–TV, in Boston. The Commission attended the DAVI Convention in Portland, Oregon (1969), surveyed equipment exhibits, held seminar discussions and regular meetings, and it appeared at the NAEB Convention of the same year in Washington. Other site visits were made by individual Commission members and by AED staff members and reports prepared for the Commission.

Special equipment and methods demonstrations showing examples of films and tapes were presented to the Commission in Dearborn when it studied industrial training methods for workers of the inner city and in Cambridge where it studied advanced instructional technologies and educational facilities.

The Commission did not hold traditional formal hearings, but a few selected individuals were invited to give evidence and professional judgments.[5] Some professional groups were invited for discussion of their work and perspectives on broad and long-range learning technologies. For instance, the Educational Media Council met with the Commission at the Ford Foundation building in New York, and each representative presented his views and suggestions and responded to inquiries.

When important questions arose on which the Commission needed sound and useful judgments, selected individuals from wherever they were in the nation were brought to Washington for "instant seminars" on the subject. A few Commission members always attended these seminars, and recordings were made and transcribed of the discussions. "Instant seminars" were held with representatives of disadvantaged urban students, experts

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[3] For example: Robert Hudson prepared a paper on "The Future of Educational Television," Allen Kent contributed a document on "Information Science: Media Implications of the New Means of Information Organization." Charles Schuller developed a thorough statement on: "Production Facilities Needed in Order for a University to Adequately Satisfy Its Instructional Technology Requirements." Anna Hyer and Leslie P. Greenhill prepared essays on instructional technology developments in England and Japan respectively titled "Activities of the National Council for Educational Technology in Great Britain," and "The Expanding Usage of Instructional Technology in Japan."

[4] The Executive Committee has recommended that the Academy of Educational Development publish a selection of 130 of the resource papers. Most papers are listed in the appendix of the published report.

[5] Among these, for example, were William Harley, James Miller, John Macy, and Edwin Cohen.

on satellite developments, and national leaders in the educational television and radio broadcast fields.

It should be obvious by now that the CIT was provided with a vast amount of information pertinent to its defined and complex mission. No member, unless he were free to work full time on Commission business, could have read and studied all of the materials that were made available. I attempted to reduce the reading demands and increase coverage of the literature by providing the Commission with over eight hundred bibliographic references and abstracts of literature in the area of communications and instructional technology. There were also available some reports and information services from the ERIC Clearinghouse on Educational Media and Technology at Stanford University.

From the discussions and debates following the provision of extensive information, there began to develop judgments and opinions in the Commission. Some issues were debated intensively, especially those which related closely to emerging recommendations.[6] Generally the Commission worked in a critical but constructive and imaginative mood.

Issues

The Issue of Definitions. The CIT early in its deliberations was compelled to arrive at a consensus on whether or not it was to focus deliberations on teaching, or learning, or both. Instruction was defined to include both teaching and learning, but CIT agreed to put its major emphasis on the learning processes and conditions and contingencies affecting learning. In one sense its task was to understand how technologies from books to computers and satellites could be used to design and create optimum conditions and contingencies for complex human learning and personal development.

After considerable disputation, technology was defined to mean not just the equipment and hardware configurations but also to include people, personalities, and human factors and skills as well as programs or software. An escape by means of semantics was never quite provided, however, for avoiding the distasteful, and inelegant terms, hardware and software. Nevertheless, technology was given a very broad interpretation so as to encompass all elements on an instructional activity or wholistic operation including the terminal learning effects and behavioral or performance changes.

Early in its work in 1968 CIT members had considerable ambiguity about the issues of the humanistic values and the effects of technology on people. At that time possible dehumanization of people by mass media and the machines of contemporary society were subjects for vigorous discussions. Eventually sets of neutral instrumental functions were ascribed to *technology* especially when the term was defined to include human factors, personalities, and performances.

A final definitional issue was that of the research and development scale or continuum. The Commission sought to conceptualize a continuity of effort ranging from pure theoretical research at the left extreme through research development to demonstrations and field trials to eventual full-scale operations on the right. The research and development plus dissemination as prescribed by NDEA-Title VII, Sections A and B, did not seem to be entirely adequate. Accordingly, the full range of sequential activities from research through development to application, or *R*, *D*, and *A*, came to symbolize the whole operation for the Commission; thus, R–D and A are terms used prominently in the final report.

Issues of Present States of Affairs. Issues were stated and questions raised about the efficacy and extent of use technologies in education. When a broad spectrum of information and communication technologies ranging from printing to satellites is reviewed and evaluated

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[6] After several months, the professional staff writers, especially Sidney Tickton, Judith Murphy, and Ronald Gross wrote successions of tentative drafts of reports and recommendations. These were often sent to CIT members for intensive study and content editing. The drafts were criticized extensively in full Commission sessions. The writers had a triply difficult task of (1) representing and translating the states of the arts, that is, the prevailing conditions of instructional technology, (2) of informing members of CIT, and (3) of acting as mediators for the final judgments and recommendations.

relative to effectiveness, usefulness, and acceptance, we see that there is great variability on all dimensions of a systematic evaluation. Effectiveness and acceptance, although positively related, may not be highly correlated. Print, duplication, telephonic, and computer technologies have been extensively accepted, purchased, and put to use in education. Radio, television, and motion picture technologies seem to have potentials and promises beyond the level of their acceptance for formal instruction. The CIT raised the question of what are the conditions which have led to the irregularity of acceptance and use in education of different modern communication technologies.

A related issue was that of determining the conditions, contingencies, and functions which can or should be mediated by equipment components and systems, and those which can or should be mediated by people—teachers, other professionals, technicians, and support personnel. Can there be trade offs, the Commission asked, between the uses of equipment and the work of people? How can the efforts and energies of teachers be extended, multiplied, and made precisely appropriate to defined functions? How can instruction by using appropriate technologies be made more effective, efficient, and productive? If cost benefit data were available, which they are not, would this information increase the effective and appropriate use of available instructional technologies?

Generally Accepted Propositions

After consideration of these and related issues and questions, the Commission generally accepted a number of propositions:

> The communications revolution of the past fifty years has provided education with tools and instruments that have great potential worth for education.
>
> The growing needs and demands for education in all world populations generally tend to exceed the abilities of organized educational institutions to meet these needs and demands.
>
> The more successful an educational effort is, the greater the demands will become because education is *a demand creating* enterprise rather than exclusively a demand satisfying enterprise.
>
> There is urgent need for developing and using the total *systems operations approach* to designing and implementing instructional technologies.
>
> The equipment and instrument systems now available exceed in sophistication and potential usefulness the levels of knowledge and skills required for their full use to provide good conditions for learning at many levels of education.
>
> There is extensive need for a wide range of research on human learning, and also need for integrating, interpreting, and applying to education the available results of research.
>
> There are in this nation and all over the world vast riches of books, films, tapes, objects, and art forms that are not actually available for use when and where needed in instructional situations and programs.
>
> The media of print have been well developed by the education related industries but the same level of adequacy has not been reached for multimedia systems approaches to instruction and especially for the newer electronic media.
>
> The present organization of efforts on the federal level, where the responsibility of the Commission rests, is not adequate to accomplish what needs to be done and therefore other organizational arrangements are required.
>
> Strong and sustained leadership is needed to stimulate, coordinate, and guide needed developments on the state and local levels.
>
> However, there should be a balance of emphasis and effort on the local, state, and national levels.
>
> The extent and challenge of the task of developing and using relevant and urgently required technology of instruction requires coordinated private and public efforts and expenditures.
>
> Adequate risk capital for new development and research and for production and testing instructional programs for the newer media is not available in sufficient amounts from private sources and therefore, the federal government must provide this research and development capital.
>
> Regardless of the adequacy and relevance of research data and detailed information, life-like wholistic demonstrations of large scope that are clearly and evidently successful are needed to introduce and set visible *model* patterns for new systems of instructional technologies.

Areas of Uncertainty

There were areas of thought, judgments, and information about which the Commission of necessity was uncertain and ambiguous. This was true partly because of the lack of or limits to information and fact, and partly because of the differences in judgments honestly held by members of the Commission and

of the staff of the administering Academy for Educational Development.

There was uncertainty in the Commission about the adequacy of valid results and information on the conditions, principles, and processes of human learning.

There was a lack of consensus about the extent to which modern communication technologies have been shown to be successful or unsuccessful.

As has been indicated, there was extensive debate about and reiteration of the theme of the dehumanizing effects of educational technologies, and more specifically the effects on subjective value commitments of children and youth, the effects on attitudes and on behavior over a wide range of activities extending from creativity to aggressivity, crime, and violence.

There was uncertainty about whether or not and to what extent instructional technologies, particularly the computer, should be used for individualizing instruction, for distributing information to dispersed populations, or for transforming and displaying information to facilitate learning.

The Commission could not be very definitive on the basis of its information about what major new technological components of instructional systems need to be developed, like response systems, satellite relays, and mode transformation devices. Neither could the Commission prescribe with precision how existing technologies could best be employed to resolve the educational problems of the inner city, to meet the needs of minority and disadvantaged groups, and to reach effectively the inaccessible poor of rural areas in mountainous regions or the broad extended plains.

Except to recommend explorations and demonstrations, the Commission could not specify how to incorporate rapidly advancing new technologies of information storage, retrieval, and distribution with coherent, practical, and optimized instructional systems. Nevertheless, it proposed means for attacking these problems.

Perhaps the area of greatest uncertainty for the Commission was that of cost-benefit relationships—cost, first, of instructional technological systems and second, cost of putting into effect the several recommendations that the Commission made to the President and the Congress.

Recommendations

First, the Commission recommended the establishment by Congress of a set or number of National Institutes of Education within the Department of Health, Education, and Welfare. The several program-oriented institutes should be broadly authorized to develop, support, and provide funds for greatly strengthened programs of educational research, development, and application (R, D, and A). Clearly in making this recommendation the Commission used the model of the National Institutes of Health and thus prepared the way for its next recommendation, which grew centrally out of its mission in the field of instructional technology. The first and general recommendations grew out of the strong conviction of the Commission members that the development and uses of instructional technologies had to be conceived of and conducted in a functional educational context where technologies serve instrumentally for achieving specified learning goals.

The second recommendation was for a National Institute of Instructional Technology (NIIT). This institute was selected as the means that could be employed at the Federal level for advancing *research*, *development*, and *application* of equipment, programs, instructional materials, and integral systems of these. Other activities prescribed for the NIIT would fulfill the defined purpose as conceived by the Commission. Among these activities would be the encouragement of programs of training people in professional and technical skills needed for developing and operating advanced technical systems for instruction and learning. The Commission proposed, furthermore, that the Research and Development Centers and Regional Educational Laboratories, which are now administered in the U.S. Office of Education under Title IV of the Elementary and Secondary Education Act of 1965 and which are appropriately involved with instructional tech-

nologies for learning, be administered in the future by the proposed NIIT. Furthermore, the NIIT would be authorized to extend established or to build new centers as required to carry out the mission. This program and the principal research, development, and application programs in the broad media field of the USOE are recommended to be transferred to the National Institute of Instructional Technology. Thus, the Commission visualized clearly the possibilities of federally administered programs in the broadly defined areas of instructional or learning technologies. There should be a network of an adequate but not excessive number of these centers and laboratories located throughout the nation.

In a period when Research and Development Centers and Regional Educational Laboratories, which together span the range from theoretical research to effective applications, are being discontinued, it must be encouraging to those responsible to have a presidential commission express confidence in their efforts and to recommend strengthening and expanding the programs.

The Commission's third recommendation proposes that NIIT initiate and develop a unique kind of library facility and activity. Its uniqueness should consist in its emphasis on scanning and searching the national and world fields for learning materials that may be secured and transformed into useful and available stimulus materials for learning. The set of functions does not include emphasis on the cataloging and storing of printed materials. It was visualized that the clear and evident development of hardware relative to software should be corrected by a strong effort to secure, adapt, and use materials and programs that exist and can be made available.

The second phase of the solution to providing a hardware-software balance was not neglected, but neither was it emphasized in the Commission's report. That phase is the provision for a national complement of instructional program production centers. In this domain the national requirement and private enterprise urgently need to cooperate to produce nonprint instructional materials in large but carefully designed quantities and of high quality. Here the required investment of capital is great, and it appears that private industry does not have the investment capital necessary to provide for the production of what can be seen to be ideally required.

Evidently the Corporation for Public Broadcasting and its projected programs intersect at many points with the recommendations of the Commission. Indeed, the National Institute of Instructional Technology could be a second but larger wing of this broadcasting operation. The dividing lines between the two wings could be of formal and semi-formal instruction and learning on the one hand and of informal public information and cultural broadcast programs on the other hand.

The Commission's fourth recommendation was directed to an extension and replacement of previous and ineffective dissemination programs and to provide a means of showing what really can be done by advanced instructional technology systems. Also, this recommendation was focused on defined target populations. It was realized that the time is late for the inner city or for the rural zones of poverty and neglect. A full-scale dramatic emphasis is justified, or so the Commission proposed. Thus, a living, wholistic, brilliantly conceived and fully developed demonstration is proposed for none other than the entire edcational system of the nation's capital and the surrounding suburbs. Let the beautiful but sick city of Washington be a proving ground for all of the best that can be done, advanced technology included, to exemplify to the whole nation and to the watching world how to build a model educational system by all means necessary including all relevant instructional systems peaked to maximum efficiency and effectiveness. To launch this full-scale demonstration, the costs will be great and the efforts as demanding as war. There will be great risks of both successes or failures but the possible rewards and substantive gains may be worth the focused attention, efforts, and energies of this affluent nation.

Recommendation five grew out of the developed sensitivities of Commission members to the critical needs for better people, better trained than presently, at all levels of the educational system. In particular the Commissioners sensed and judged the need for greatly improved skills for administration and management of most educational enterprises. Here many training programs, including the Education Professional Development Act that is now in effect, need to be expanded. The province of professional education needs to realize and to use the contributions that may be made to the mammoth job of educational management by other professional development agencies like schools of business, engineering, law, and the arts and sciences.

The sixth recommendation of the Commission related to the desideratum for activating and releasing the potential powers of cooperative work between federal and state agencies and business and industry. The Commission suggested that a National Council of Education and Industry with appropriate representation could effectively serve important innovative and development functions. Such a council properly conceived and executed could actually achieve the ideal aims long sought by the present but weak Educational Media Council. In such a council, properly operated, the ambiguity of governmental representatives and the timidity of great industries for doing what needs to be done in education may be overcome. The irrational and wasteful equipment purchasing activities could be changed to sound management and effective procurement. Duplication of efforts on materials and equipment may be related to needs for really innovative and useful equipment developments. The problems of antiquation, lack of adequate functional specifications, variable and incompatible standards, copyrights, and restraints of trade are some of the problems that a national council could attack and solve.

The Most Difficult Decision

No issue that confronted the Commission was more difficult than that of deciding on the cost of its several recommendations to the Federal Government. In a nation of this size with a population of two hundred million people and a gross national product approaching a trillion dollars, what is the amount of money that the Federal Government should invest in instructional technology? What is that *critical level of investment* which will make a practical and significant difference in the effective uses of educational technologies? What is the threshold level where funds in smaller amounts will produce inadequate results and in larger amounts are excessive? Involved are many factors that are complexly related and algebraically summed. With admittedly fewer facts than desirable, but with the best judgments that could be summoned, the Commission estimated that reasonable costs of all recommendations could amount to $565 million for the years 1971 and 1972: $150 million for launching the National Institutes of Education; $250 million for research, development, and application activities of the National Institute of Instructional Technology; $25 million for the new search, find, procure, transform, and make available library activity; $100 million for the Federal Government's part of the full-life demonstration model development in Washington; and $40 million for training and professional development of people in education with special emphasis on the needs for communication and learning technologies.

Thus stands the report, *To Improve Learning*, of the Commission on Instructional Technology that is at long last revealed and ready for public debate and legislative action.

GLOSSARY

CAP	Community Action Program
CATS	Community Antennae Television Service
COMSAT	Communications Satellite
FHA	Federal Housing Administration
HUD	Housing and Urban Development
INTELSAT	International Satellite
ITFS	Instructional Television Fixed Service
NCTA	National Cable Television Association
NET	National Educational Television
PTV	Public Television
RC & D	Resource Conservation and Development
TAP	Technical Assistance Program
TVBS	Television Broadcast Satellite
WETA	Washington Educational Television Association

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Proceedings of this conference prepared by

Editorial Services, Department of Conferences
The University of Georgia Center for Continuing Education
Athens